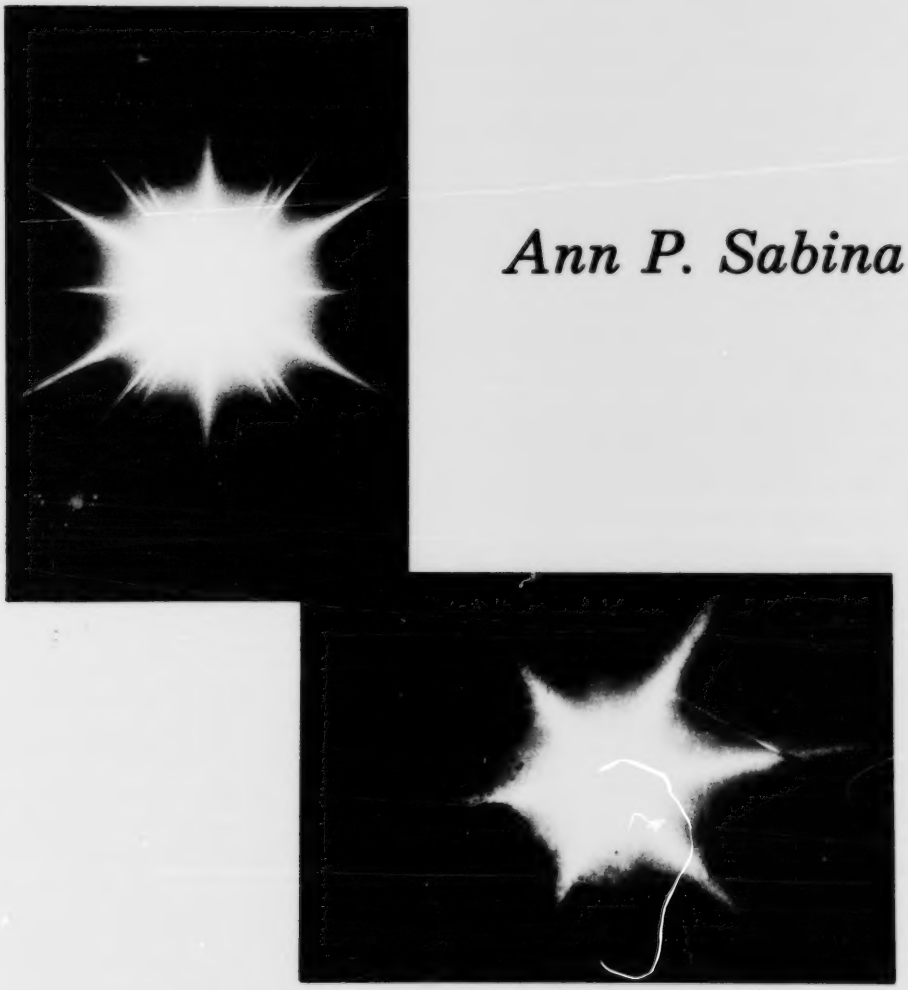
ROCKS AND MINERALS FOR THE COLLECTOR



Ann P. Sabina

Hull-Maniwaki, Quebec
Ottawa-Peterborough, Ontario

Canada

88-01684/

Cover

Phlogopite mica showing asterism.

Top: *Portland Township, Quebec. National Mineral Collection specimen No. 61985*

Bottom: *Wakefield Township, Quebec. National Mineral Collection specimen No. 43820*

Geological Survey of Canada

Miscellaneous Report 41

ROCKS AND MINERALS FOR THE COLLECTOR

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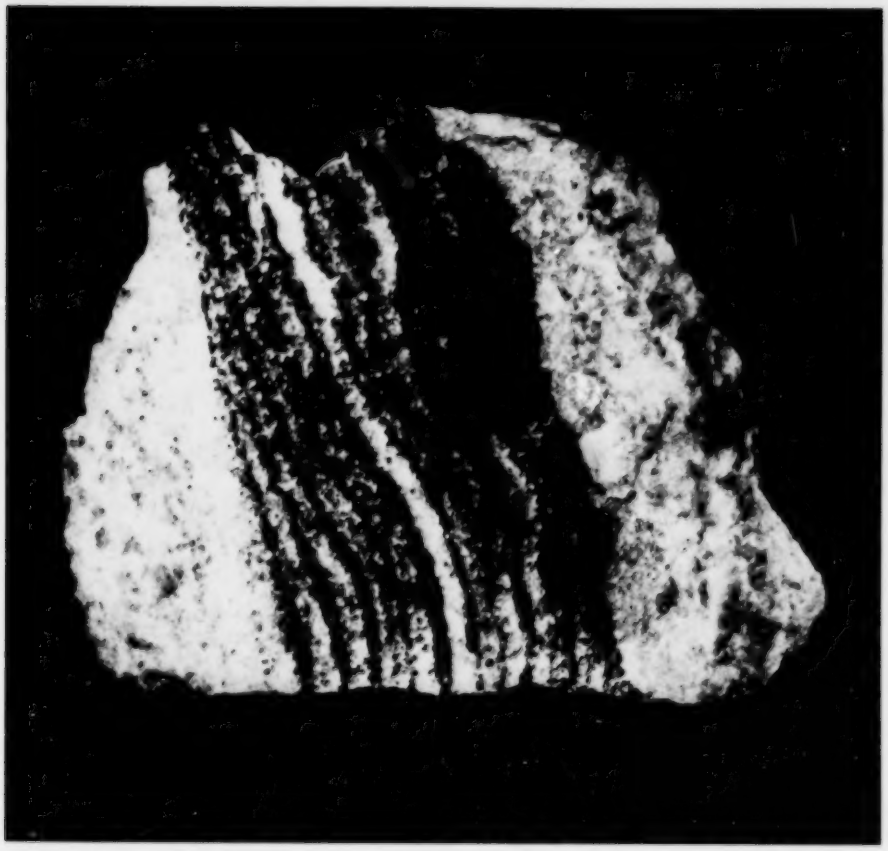


Frontispiece. Tochilinite-bands in serpentine marble, Cross quarry, Wakefield, Quebec. The bands are composed of disseminated and nodular tochilinite with minor pyrrhotite, pyrite, pyroaurite and perovskite, Actual width of banded zone is 7 to 7.5 cm (GSC 203247-A).

Abstract

Occurrences of minerals, rocks and fossils are described from about two hundred easily accessible localities in the Gatineau River area between Hull and Maniwaki, Quebec, and along Highway 7 from Ottawa to Peterborough, Ontario. The localities furnish a wide variety of specimen material and some minerals and rocks suitable for lapidary purposes.

In the Gatineau district, which reached its peak of mining activity in the 1880s and 1890s, there are numerous abandoned mica-apatite mines. Good specimens of these minerals and of associated silicate minerals are available from the dumps. Other nonactive mines in this region include deposits of iron, brucite, molybdenum, feldspar, barite, zinc, asbestos, quartz and limestone. Minerals and rocks suitable for lapidary purposes can be found, for example serpentine, marble, scapolite, feldspar (peristerite, amazonite), diopside, graphic granite, but this area is not notable for its variety or abundance of ornamental-type material. One mine, the Leduc, was exploited for gem (tourmaline). Fossils occur only in the Hull area.

Deposits in the Ottawa-Peterborough area that are currently in operation include talc, nepheline, marble, and limestone. Inactive mines are more numerous; they were worked for gold, fluorite, iron, feldspar, sulphur, arsenic, lead, copper, uranium, apatite and actinolite. The earliest gold mines in Ontario were operated in the area north of Madoc and Kaladar, and some of the earliest iron mines were worked in the Marmora area. Nepheline, cancrinite, marble, serpentine, epidote, peristerite and graphic granite are examples of the available lapidary material. Ordovician fossils are abundant in road-cuts and in limestone quarries near Peterborough.

Résumé

La présente brochure donne la description de venues de minéraux, de roches et de fossiles d'environ deux cents emplacements d'accès facile, dans la vallée de la rivière Gatineau, entre Hull et Maniwaki, au Québec, et le long de la route 7, d'Ottawa à Peterborough, en Ontario. Les emplacements renferment une grande variété de spécimens et quelques minéraux et roches et qualité lapidaire.

Le district de la Gatineau, où l'activité minière était à son maximum entre 1880 et 1900, renferme de nombreuses mines de mica-apatite abandonnées. Les haldes contiennent de beaux spécimens de ces minéraux et de minéraux silicatés associés. D'autres mines non exploitées de cette région comprennent des gisements de fer, de brucite, de molybdène, de feldspath, de barytine, de zinc, d'amiante, de quartz et de calcaire. On peut y trouver des minéraux et des roches propres à la taillerie, par exemple de la serpentine, du marbre, de la scapolite, du feldspath (péristérite, amazonite), du diopside, du granite graphitique, mais cette région n'est pas remarquable par la diversité ou l'abondance de matériaux du type décoratif. Une mine, la mine Leduc, exploitée essentiellement pour les pierres précieuses (tourmaline). Les fossiles se trouvent seulement dans la région de Hull.

Les gisements en exploitation de la région d'Ottawa-Peterborough contiennent du fer, du talc, de la néphéline, du marbre et du calcaire. Les mines abandonnées sont les plus nombreuses; on y extrayait de l'or, de la fluorine, du fer, du feldspath, du soufre, de l'arsenic, du plomb, du cuivre, de l'uranium, de l'apatite et de l'actinote. Les premières mines d'or exploitées en Ontario étaient situées dans la région au nord de Madoc et de Kaladar et certaines des premières mines de fer étaient mises en valeur dans la région de Marmora. La néphéline, la cancrinite, le marbre, la serpentine, l'épidote, la péristérite et le granite graphitique sont des exemples de matériaux de qualité lapidaire. Les fossiles de l'Ordovicien abondent dans les déblais des routes et dans les carrières de calcaire à proximité de Peterborough.

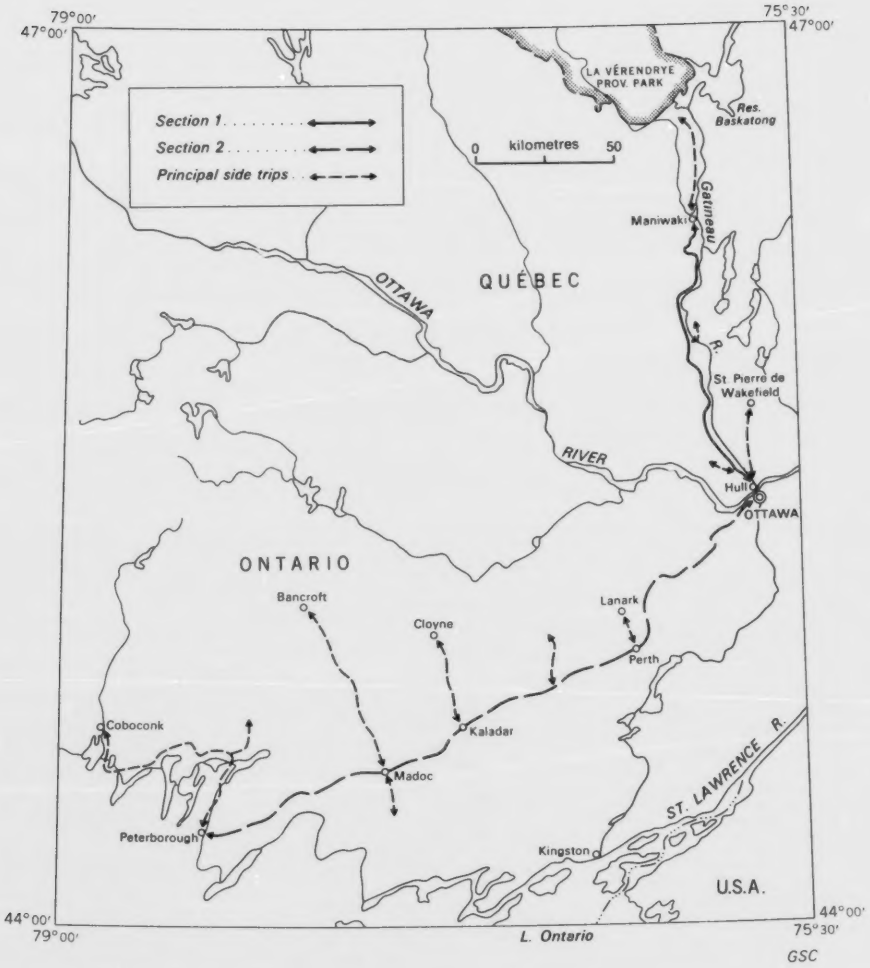


Figure 1. *Index map showing collecting routes.*

ROCKS AND MINERALS FOR THE COLLECTOR: HULL-MANIWAKI, QUEBEC OTTAWA-PETERBOROUGH, ONTARIO

INTRODUCTION

This booklet, originally published in 1970 as Geological Survey of Canada Paper 69-50, describes mineral, rock and fossil occurrences between Peterborough, Ontario and Maniwaki, Quebec. This edition incorporates the metric (SI) system to road logs, weights and measurements, and includes changes made to the Quebec highway numbering system and minor revisions to the text. It complements Geological Survey of Canada Miscellaneous Reports 32 and 33 which describe collecting localities to the south and east of this guidebook area (see page 120).

Most localities are easily accessible from main highways and from sideroads, but to reach some a hike of about 3 km may be required. Directions to reach each of the occurrences are given in the text and are designed for use with official provincial road maps. Locality maps are included where deposits may be difficult to find. Additional detailed information can be obtained from the appropriate topographic and geologicak maps listed for each locality. These maps are available from the agencies listed on page 117.

As most of the inactive mines have not been operated for many years entering shafts, tunnels, and other workings is dangerous. Some of the occurrences are on private property and the fact that they are listed in this booklet does not imply permission to visit them. Please respect the rights of property owners at all times.

The localities were visited during the summer of 1968 by the author ably assisted by Robin Lee Monroe. The field investigation was facilitated by information received from Dr. D.D. Hogarth, University of Ottawa. The laboratory identification of minerals by X-ray diffraction was performed by M. Bonardi, Geological Survey of Canada. Their assistance is gratefully acknowledged.

A brief geological history

The collecting area comprises two geological regions – the Canadian Shield and the St. Lawrence Lowland. The former is an immense shield-shaped body of Precambrian rocks occupying over half of Canada and part of the northern United States. The St. Lawrence Lowland is a flat region of unfolded Paleozoic rocks south of the Shield and north of Lake Ontario and Lake Erie.

During Precambrian time there were repeated cycles of inundation, sedimentation, mountain-building, intrusion and erosion producing a variety of igneous, metamorphic and volcanic rocks. The rocks forming the Gatineau Hills were produced during this era. The Precambrian rock formations contain deposits of mica, apatite, feldspar, molybdenite, zinc, brucite, nepheline, fluorite, talc and quartz.

At the close of the Precambrian era, a long period of erosion reduced the Shield to a nearly featureless plain and set the stage for uplift, inundation and deposition that took place during the long Paleozoic era that followed. Great thicknesses of sediments were deposited by Paleozoic seas St. Lawrence Lowland where the accumulated sediments have formed the existing sandstone, shale, and limestone deposits between Hull and Peterborough.

In more recent times, during the Pleistocene Period, great ice sheets spread southwards across the Shield and the Lowland moulding the landscape we know today and leaving behind accumulations of sand, gravel and till. As the ice withdrew marine waters flooded the southern Gatineau valley and the Ottawa River valley; this inundation has

Table 1

AGE (millions years)	ERA	PERIOD	ROCKS FORMED	WHERE TO SEE THEM
	Cenozoic	Quaternary	Gravel, sand, clay	Stream beds, gravel pits, lake shores throughout area.
			Peat	Victoria Road bog.
60		Tertiary	Not represented in collecting area	
230	Mesozoic		Not represented in collecting area	
	Paleozoic	Permian Pennsylvanian Mississippian Devonian Silurian	Not represented in collecting area	
		Ordovician	Limestone	Quarries in Hull, Fallowfield, Lakefield, Coboconk, Roblindale, Kirkwood; Highway 7 road-cuts.
			Dolomitic limestone	Beckwith Construction quarry; Ramsay Mine.
			Shale	With limestone in quarries listed above.
600		Cambrian	Not represented in collecting area	
	Precambrian		Crystalline limestone (marble)	Quarries in Tatlock, Madoc, Malone, Bancroft; Road-cuts – Gatineau Parkway, Highways 7, 105, 117; St-Pierre-de-Wakefield, Perth, South March feldspar quarries.
			Pegmatite	Stony Lake exposures; Highway 7 road-cuts Perth to Madoc.
			Granite	Mica-apatite mines in Gatineau area.
			Pyroxenite	Highway 105 road-cuts; Lac Ste-Marie road exposures.
			Garnet gneiss	Fernleigh kyanite occurrence.
			Schist	Madoc marble quarries; Highway 7 road-cuts near Madoc.
			Dolomitic marble	Madoc quarry and Highway 7 road-cut near Madoc.
			Slate	Road-cuts, Highways 62, 7.
			Amphibole	Gatineau parkway road-cuts; nepheline quarries at Nephton, Blue Mountain.
			Syenite	Highway 7 road-cut at **km 204.5**; Minnesota Minerals quarry.
			Basalt	

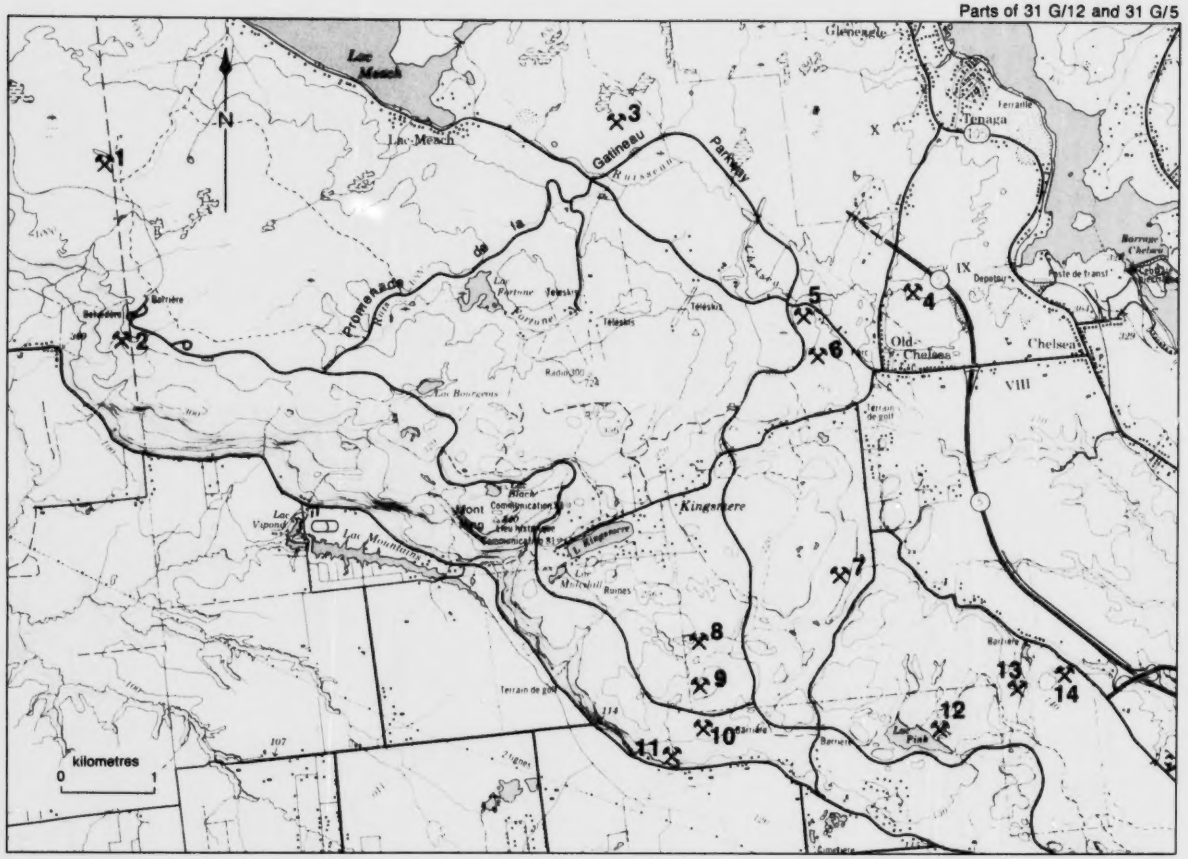
been named the Champlain Sea. Upon its retreat the sea left unconsolidated deposits of clay and sand over the Paleozoic strata. Other deposits of recent times include beach sands, stream detritus and peat bogs. The Laflèche, Lusk and Warsaw caves are examples of erosional processes of recent times.

The geological history with examples of rocks formed, is summarized in Table 1.

How to use this guide

The route, as shown in Figure 1, is divided into two sections: (1) Hull to Maniwaki via Highway 105; (2) Ottawa to Peterborough via Highway 7. There are numerous side trips leading from these main routes.

Information on each locality is systematically listed as follows: distances in kilometres (in bold type) along the highways starting at the beginning of each section; name of the locality of deposit; minerals or rocks found in the deposit (shown in capital letters); mode of occurrence; brief notes on the locality with specific features of interest to the collector; location and access; references to other publications indicated by a number and listed at the end of the booklet; references to maps of the National Topographic System (T), and to geological maps (G) of the Geological Survey of Canada, (G.S.C), the Ontario Geological Survey (O.G.S.) and the Ministère de l'Energie et des Ressources, (scale 1 inch to 1 mile unless otherwise noted).



Map 1

Old Chelsea-Gatineau Parkway area

1. McCloskey Field quarry
2. Payne property
3. McConnell Mine
4. Chamberlin quarry
5. O'Neill Mine
6. Sweeney Mine
7. Headley Mine
8. Fortin & Gravelle Mine
9. Laurentide Mine
10. Wallingford Mine
11. Cliff Mine
12. Pinks Lake Mine
13. Baldwin Mine
14. Forsyth Mine

SECTION I

HULL – MANIWAKI

km		
	0.0	**Hull, at junction Alexandre Tache Boulevard (Highway 148) and Montcalm Street. Proceed onto Montcalm Street.**
	1.25	**Turn right onto St. Joseph Boulevard (Highway 105). The main road log (indicated in bold type) follows Highway 105 north to Maniwaki. Numerous side trips lead from the main route.**
	2.6	**Hull, at junction Gamelin Boulevard and St. Joseph Boulevard. Gamelin Boulevard leads to localities along the Gatineau Parkway.**

Cliff Mine

MICA, APATITE, AMPHIBOLE, CALCITE, PYROXENE; PYRITE, TITANITE

In pyroxenite; in pegmatite

Small books of silvery amber mica occur with light green apatite crystals (averaging 1 cm across), pale green amphibole aggregates, and abundant greyish green pyroxene crystals (generally 1 cm in diameter) in salmon-pink calcite. Small grains and crystals of pyrite, brown titanite and dark green pyroxene are found in white pegmatite that is associated with the pyroxenite.

The deposit was worked by the Brown Bros. of Cantley in 1898 from 3 pits, the largest being 9 m deep. The total production was about 36 t of first class mica. The openings and dumps, now partly overgrown, are located on the south side of the Eardley escarpment overlooking the Ottawa River valley. Access is via G. Hetherington's property on the Mountain Road.

Road log from Highway 105 at **km 2.6:**

km		
	0.0	Intersection St-Joseph Boulevard (Highway 105) and Gamelin Boulevard; turn left onto Gamelin Boulevard.
	2.3	Junction Gatineau Parkway; continue straight ahead.
	2.5	Turn right onto Mountain Road.
	7.7	Junction Notch Road; continue straight ahead.
	9.3	G. Hetherington farmhouse on left. Obtain permission to pass through Mr. Hetherington's property. Opposite this farmhouse, an old road leads up the slope to a crossroad near a pond at the crest of the ridge. At this point, turn left and follow the trail to the pits, the first of which is 137 m away.

Ref.: 73 p. 107

Maps: (T): 31 G/5 Ottawa
(G): 7-1970 Gatineau Park – Parc de la Gatineau, Quebec. (G.S.C., 1:15 000)
1508A Ottawa – Hull, Ontario and Quebec. (G.S.C., 1:125 000)

Gatineau Parkway Occurrences

Road log to occurrences along the Gatineau Parkway to the Champlain Lookout (underlined localities are described in the text following this road log):

km		
	0.0	Junction Gatineau Parkway and Gamelin Boulevard; proceed north along the Parkway (this junction is 2.3 km from **km 2.6** on Highway 105).
	2.6 to 4.3	Road-cuts expose crystalline limestone containing aggregates of pyroxene, graphite, titanite, pyrite, greyish brown amphibole, pink calcite, grey orthoclase and tiny blue crystals of apatite.
	5.7	Road-cut on left. Titanite, pyrite, pyroxene and graphite are finely disseminated in crystalline limestone; black crystal aggregates of tourmaline occur in white feldspar.
	5.9	Road-cut on left exposes crystalline limestone containing graphite, pyrite, pyroxene (green crystals up to 4 cm long) and dark brown massive tourmaline.
	6.2	Turn-off to Pinks Lake Lookout.
	6.7	Turn-off to Pinks Lake parking area and to Pinks Lake mine.
	7.4 to 7.6	Road-cuts expose crystalline limestone containing dark green pyroxene, graphite, brown titanite, mica, pyrite, pink calcite, and black tourmaline.
	8.0	Junction Gatineau Parkway to Meach Lake; turn left.

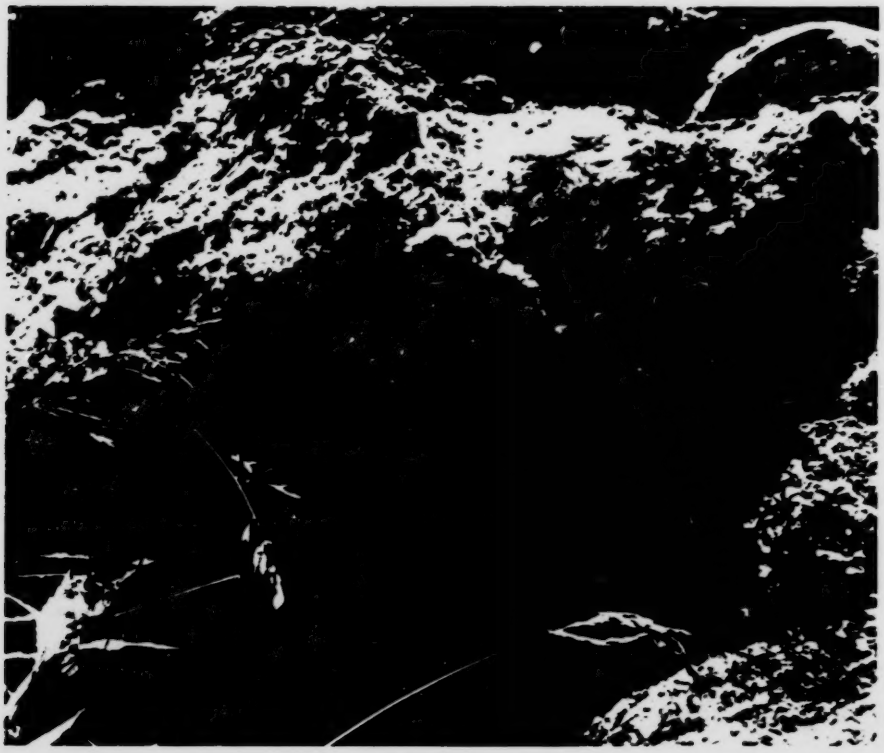


Plate I

Mica books in crystalline limestone, Gatineau Parkway road-cut. (GSC photo 151346)

9.1 Turn-offs to Laurentide, Fortin and Gravelle mines on right, Wallingford Mine on left.

9.2 to 9.6 Road-cuts at bend expose pink pegmatite and greenish grey pyroxenite. Titanite, pyrite, pyroxene, black tourmaline, epidote and yellow granular apatite occur in the pegmatite; phlogopite mica and pink calcite occur in pyroxenite.

10.0 Road-cuts expose pyroxenite associated with crystalline limestone which encloses green radiating tremolite (aggregates 2 cm to 5 cm across) and dark brown tourmaline crystals. Phlogopite mica, pink calcite and pyrite occur in pyroxenite.

10.2 Turn-off to Moorside parking area.

11.2 Turn-off to Mulvihill parking area.

13.3 Turn-off to Black Lake Lookout.

14.2 Road-cut on left exposes pyroxenite containing dark phlogopite mica, pyrite, pyroxene, epidote, titanite and pink calcite. Some of these minerals are present in crystalline limestone associated with the pyroxenite.

15.0 Turn-off to Lac Bourgeois parking area.

16.2 Junction Fortune Lake Parkway; bear left.

17.5 Turn-off to Huron Lookout. The road-cut on right exposes pegmatite containing dark green bladed aggregates of actinolite with pyrite, titanite and yellow transparent granular apatite.

17.9 Turn-off to Brule Lookout.

18.4 Road-cut on right exposes pyroxenite, crystalline limestone and some white pegmatite. Titanite crystals measuring 2 to 3 cm in length occur with mica in pyroxenite; massive titanite is associated with dark green pyroxene in crystalline limestone and in pegmatite. Dark green bladed masses of actinolite occur in calcite.

The old Payne molybdenite property is located on the slope below the Parkway opposite this road-cut.

18.8 Road-cut at gate exposes red syenite containing dark brown garnet and brown zircon.

Beyond the gate is McCloskey's field where feldspar pits are located.

Note: Parking is prohibited along the Parkway; automobiles may be parked at the numerous parking areas included in the road log.

Pinks Lake Mine

MICA, PYROXENE, CALCITE, ACTINOLITE, PYRITE, TITANITE, EPIDOTE, FELDSPAR

In pyroxenite

Mica occurs as amber books and flaky aggregates with well-formed light greyish green pyroxene prisms (averaging 1 cm across) in pale pink to white calcite. Accessory minerals include actinolite, pyrite, dark brown titanite crystals (about 1 cm long), yellowish green epidote, and pink to white feldspar.

The deposit was worked for mica during the early days of mica mining and more recently in 1945-46, Pink Lake Mica Mines Limited was the recent operator. The openings have been fenced and are not accessible. Specimens are available from the dumps.

The mine is located on a ridge on the north side of Pinks Lake opposite the Lookout. Access is via a 640 m trail that leads from the parking area (km 6.7, see page 6) along the shore of the lake.

Refs.: 12 p. 38; 13 p. 37

Maps (T): 31 G/5 Ottawa
(G): 7-1970 Gatineau Park – Parc de la Gatineau, Quebec. (G.S.C., 1:15 000)
1508A Ottawa – Hull, Ontario and Quebec. (G.S.C., 1:125 000)

Wallingford Mine

MICA, APATITE, AMPHIBOLE, PYROXENE, CALCITE; TITANITE, PYRITE

In pyroxenite; in pegmatite

Pink calcite containing dark phlogopite mica with light green apatite crystals (commonly 1 to 2 cm in diameter), and light green pyroxene crystals (about 3 cm across) occurs in pyroxenite near the contact with biotite gneiss. Small mica books are common. Bluish grey amphibole asbestos is abundant in pyroxenite that occurs near its contact with pink pegmatite containing dark green pyroxene, brown titanite (crystals measuring up to 2 cm long) and pyrite.

The deposit was worked for mica by a series of pits the deepest being 10.6 m. Operations were conducted by the Wallingford Bros. for about 1 year in 1905.

The mine is located on the crest of a ridge between the Gatineau Parkway and the Mountain Road. Access is from km 9.1 (just beyond the point where the Parkway bridges a gully, see page 7). From the Parkway, walk left (south) along the gully to the intersection of another depression; then bear right and proceed up the ridge to the pits. The distance from the Parkway is approximately 230 m.

Ref.: 72 p. 107

Maps (T): 31 G/5 Ottawa
(G): 7-1970 Gatineau Park – Parc de la Gatineau, Quebec. (G.S.C., 1:15 000)
1508A Ottawa – Hull, Ontario and Quebec. (G.S.C., 1:125 000)

Laurentide Mine

MICA, APATITE, PYROXENE, CALCITE, TITANITE, ACTINOLITE, MOLYBDENITE, FLUORITE, PYRITE, CHLORITE, QUARTZ

In pyroxenite

Phlogopite mica is associated with sea-green apatite crystals (about 1 cm in diameter) and with greyish green pyroxene crystals (1 to 2 cm across) in salmon-pink to white calcite. Minerals occurring less commonly in the white calcite are: titanite as tiny dark brown crystals; actinolite, as green splintery aggregates; molybdenite (uncommon); fluorite (uncommon), as colourless, light green and purple small crystals generally associated with pyrite; chlorite, as muddy green, earthy patches; and colourless to smoky massive quartz.

The deposit was opened for mica in 1899 by the Brown Bros.. and was later (1904) acquired by the Laurentide Mica Company which conducted operations for some 10 years. Over 20 pits were opened the deepest being 24 m. The property is located on the north side of the Gatineau Parkway, opposite the Wallingford Mine. Access is via an

old mine-road that leads north from the Parkway on the west side of the gully that is bridged by the Parkway at km 9.1 (see page 7). The larger pits and dumps are about 90 to 140 m from the Parkway.

Ref.: 73 p. 108

Maps (T): 31 G/5 Ottawa
(G): 7-1970 Gatineau Park – Parc de la Gatineau, Quebec. (G.S.C., 1:15 000)
1508A Ottawa – Hull, Ontario and Quebec. (G.S.C., 1:125 000)

Fortin and Gravelle Mine

MICA, APATITE, PYROXENE, CALCITE, SCAPOLITE, TITANITE, TOURMALINE, PYRITE, FELDSPAR

In pyroxenite

Dark brown phlogopite, blue-green apatite (massive and crystals 1 to 2 cm in diameter), and lustrous dark green pyroxene (crystals to 1 cm across) are common in salmon-pink calcite. The next most abundant mineral is scapolite which occurs in calcite and in white feldspar as green to grey prismatic aggregates having a woody appearance. Relatively uncommon in the deposit are pyrite, tourmaline (brown granular aggregates in calcite) and titanite (dark brown grains).

Messrs. Fortin and Gravelle of Hull operated the deposit for mica from 1899 to 1906. Two pits, one 27 m, the other 6 m deep, were opened. They are situated on the crest of a ridge approximately 730 m north of the Laurentide Mine to which it is connected by a trail.

Ref.: 73 pp. 107-108

Maps (T): 31 G/5 Ottawa
(G): 7-1970 Gatineau Park – Parc de la Gatineau, Quebec. (G.S.C., 1:15 000)
1508A Ottawa – Hull, Ontario and Quebec. (G.S.C., 1:125 000)

Chaput-Payne Mine

MOLYBDENITE, URANINITE, PHLOGOPITE, DIOPSIDE, ACTINOLITE, TITANITE, MICROCLINE, SCAPOLITE, APATITE, ZIRCON, PYRITE, PYRRHOTITE, SPHALERITE, GOETHITE, GYPSUM, JAROSITE, POWELLITE, WULFENITE

In calcite at contact of calc-silicate rock and granite gneiss.

Molybdenite crystals measuring up to 8 cm in diameter occur with uraninite octahedra (up to 7 cm across) and phlogopite crystals (up to 8 cm across) in pink calcite. Associated minerals include: dark green diopside crystals up to 20 cm across, dark green bladed actinolite 5 to 8 cm across, brown titanite crystals up to 10 cm long, small microcline crystals, grey to greenish scapolite, colourless to light green apatite, small lilac-coloured zircon crystals, pyrite cubes up to 5 cm along an edge, pyrrhotite, goethite. Powdery yellow jarosite and 'micro' crystals of colourless gypsum occur as coatings on goethite. Green powdery coatings of powellite occur on molybdenite and white wulfenite is reported to form coatings on uraninite (Ref. 23a).

The deposit was prospected during World War I when there was a sudden demand for molybdenite. Several prospect pits were opened, the largest being 7.6 m across and 4.5 m deep. Records do not, however, indicate any production. The pits are located along the slope below the east end of the Champlain Lookout (km 18.4, see page 7).

Refs.: 22 p. 137; 23a p. 79-81; 43 p. 19-20

Maps (T): 31 G/5 Ottawa
(G): 7-1970 Gatineau Park – Parc de la Gatineau, Quebec. (G.S.C., 1:15 000)

1508A Ottawa – Hull, Ontario and Quebec. (G.S.C., 1:125 000)

McCloskey Field Feldspar Occurrence

FELDSPAR, QUARTZ, PYROXENE, TITANITE, URANOTHORITE, GRAPHIC GRANITE

In pegmatite

Pink feldspar (microcline) and white quartz are the predominant constituents of the pegmatite. Accessory minerals occurring sparingly include dark green pyroxene, brown titanite and uranothorite. Graphic granite is relatively common.

The deposit was worked from 2 small pits about 55 years ago; a few tonnes of feldspar are reported to have been shipped.

To reach the pits proceed along the Parkway for about 1.6 km beyond the gate at km 18.8 to the second clearing beyond the junction of the McCloskey Road. Turn right and proceed across the clearing, then through an opening in the woods to the pits on the crest of a ridge (about 365 m from the Parkway).

Refs.: 43 pp. 19-22; 80 p. 63

Maps (T): 31 G/12 Wakefield
(G): 7-1970 Gatineau Park – Parc de la Gatineau, Quebec. (G.S.C., 1:15 000)

1508A Ottawa – Hull, Ontario and Quebec. (G.S.C., 1:125 000)

This completes the side trip along the Gatineau Parkways; the main road log along Highway 105 is resumed.

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km 3.0 Hull, at intersection Highway 105 (St. Joseph Boulevard and St. Raymond Street).

Canada Cement Quarry

CALCITE, PYRITE, GYPSUM, CHALCEDONY, FOSSILS

In limestone

The calcite occurs as colourless to white crystals (tabular, scalenohedral and rhombohedral) lining fractures in the limestone. It fluoresces deep yellow when exposed to ultraviolet rays ('long' rays are more effective than the 'short'). Pyrite occurs sporadically with the calcite, and gypsum is found as white to yellow encrustations on the calcite. Bluish grey and brownish mottled chalcedony nodules and lenses occur in the limetone. Ordovician (Black River-Trenton) fossils including brachiopods, trilobites, bryozoans and worm burrows are present in the rock. In places, the limestone is coated with a dull black bituminous material. The limestone is dark grey, medium- to coarse-grained, has a high calcium content, and contains some shale. It was used for the manufacture of cement.

The quarry and cement plant were opened in 1903 by the International Portland Cement Company Limited which purchased 330 acres of limestone-underlain land in the Hull area. In 1909 Canada Cement Company acquired the property and operated it continually until 1975. The quarry measures 550 m long, 245 m wide and is approximately 36 m deep.

To reach the quarry from St. Joseph Boulevard, turn right onto St. Raymond Street and proceed 2 blocks to the gate.

Refs.: 21 p. 18; 25 pp. 63-66; 43 pp. 29-30; 62 p. 76

Maps (T): 31 G/5 Ottawa

(G): 413A Ottawa (G.S.C.)

1508A Ottawa – Hull, Ontario and Quebec. (G.S.C., 1:125 000)

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km 6.1 Ironside, at junction Freeman Road.

Forsyth Mine

MAGNETITE, HEMATITE, HORNBLENDE, GARNET, PYRITE, GRAPHITE, PYROXENE, TITANITE, APATITE, SPHALERITE, CHLORITE, FLUORITE, TALC, SCAPOLITE, HISINGERITE

In crystalline limestone

The ore mineral, magnetite, occurs in massive form and as grains; hematite is admixed with it. Hornblende and dark reddish brown garnet are the most common gangue minerals. Other minerals associated with the deposit are: pyrite, graphite, pyroxene, titanite, apatite, sphalerite, chlorite, fluorite (rare), talc, scapolite and hisingerite.

The deposit was known since 1830 when Lieut. F.H. Baddeley reported it to the Literary and Historical Society of Quebec. It was opened in about 1848 by Forsyth and Company of Pittsburgh; the company is reported to have shipped 12 000 t of ore averaging 60 per cent iron by 1858. In 1867 a blast furnace was built at the mine but it was not successful and was operated for only 6 months. The mine was operated by an open-cut and a shaft. The open-cut measures 213 m long, 3 to 36 m wide and 15 m deep. During the last 100 years, the mine has been worked intermittently by various operators.

Road log from Highway 105 at **km 6.1**:

km		
	0.0	Turn left onto Freeman Road.
	3.5	Junction Mine Road; turn right.
	3.6	Entrance to Forsyth Mine on left.

Refs.: 43 pp. 23-24; 58 pp. 11-12; 66 pp. 37-38; 68 p. 156

Maps (T): 31 G/5 Ottawa
(G): 7-1970 Gatineau Park – Parc de la Gatineau, Quebec. (G.S.C., 1:15 000)

1508A Ottawa – Hull, Ontario and Quebec. (G.S.C., 1:125 000)

Baldwin Mine

This deposit is similar to that at the Forsyth Mine and was opened about the same time. The workings consist of numerous pits, the largest being approximately 33 m long, 6 m wide and 15 m deep. The mine is 762 m west of the Forsyth property.

Road log from Highway 105 at **km 6.1** (see above):

km		
	0.0	Turn left onto Freeman Road and proceed toward Forsyth Mine.
	3.6	Forsyth Mine on left; continue straight ahead.
	4.3	Trail on left. Proceed along this trail for about 550 m to the mine.

Refs.: 66 pp. 37-38

Maps (T): 31 G/5 Ottawa
(G): 7-1970 Gatineau Park – Parc de la Gatineau, Quebec. (G.S.C., 1:15 000)

1508A Ottawa – Hull, Ontario and Quebec. (G.S.C., 1:125 000)

Headley Mine

MICA, APATITE, PYROXENE, CALCITE, WILSONITE, ACTINOLITE, TITANITE, TOURMALINE, GARNET, VESUVIANITE, QUARTZ, PYRITE, PYRRHOTITE, SPHALERITE, PLAGIOCLASE

In crystalline limestone

Silvery-amber mica and blue to bluish green apatite were formerly recovered from this deposit. They occur in salmon-pink calcite veins cutting the limestone and, less commonly, in pyroxene rock. Well-formed mica books showing double asterism are collectors' items. Green to greyish green pyroxene crystals, generally less than 1 cm in diameter, are common in the calcite. Other minerals associated with the deposit are: mauve-coloured wilsonite, green prismatic, actinolite, titanite, black tourmaline, garnet, vesuvianite, quartz, pyrite, pyrrhotite, sphalerite and plagioclase feldspar.

The wilsonite is suitable for fashioning into cabochons but not generally for larger articles since it contains irregularly spaced mica inclusions.

The deposit was operated 75 to 85 years ago by numerous pits, the largest measuring 12 m by 45 m and 6 m deep. It was worked in 1960 by Mr. Leo Joanisse of Hull. The property belongs to Walter C. Cross and Company. It is located in a wooded area west of Notch Road.

Road log from Highway 105 at **km 6.1** (see page 11):

km		
	0.0	Turn left onto Freeman Road and proceed toward Forsyth Mine.
	3.6	Forsyth Mine on left; continue straight ahead.
	6.5	Junction Notch Road. Proceed straight ahead from the gate along the old mine-road for about 640 m to the mine.

Refs.: 43 pp. 25-26; 68 p. 156

Maps (T): 31 G/5 Ottawa
(G): 7-1970 Gatineau Park – Parc de la Gatineau, Quebec. (G.S.C., 1:15 000)
1508A Ottawa – Hull, Ontario and Quebec. (G.S.C., 1:125 000)

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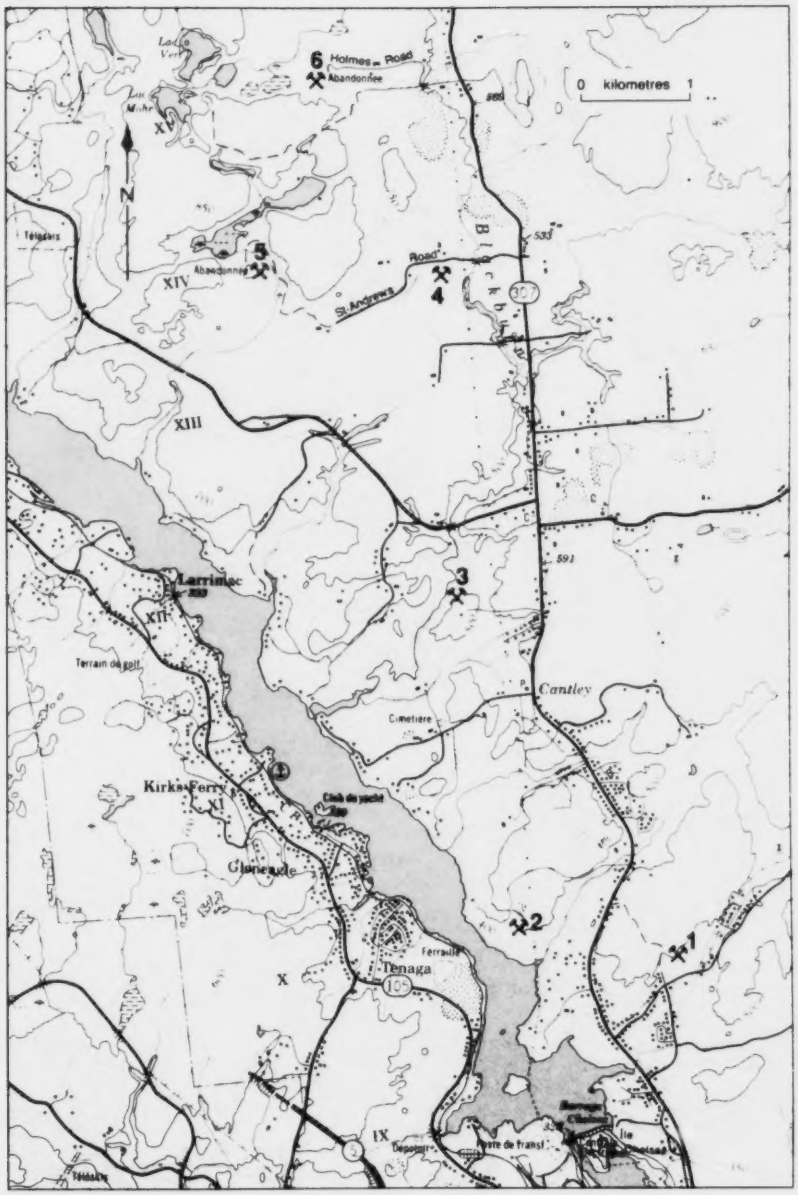
km 7.5 Junction road to Alonzo Wright bridge and Highway 307.

Cantley – St-Pierre-de-Wakefield Occurrences

Road log for side trip to Cantley – St-Pierre-de-Wakefield area (localities described in text following this log are underlined):

km		
	0.0	Highway 105 at turn-off to Alonzo Wright bridge; proceed over bridge toward Limbour.
	0.8	Junction Highway 307; turn left.
	4.5	Road-cut on right exposes crystalline limestone and white pegmatite containing grains of pyroxene and titanite.
	5.0	Junction, on right, Denis Road to Foley Mine.
	7.2	Junction, on left, Romanuk Road to Nellie and Blanche Mine.
	10.0	Junction, on left, road to Blackburn Mine.
	10.4	Road-cut on right exposes finely disseminated pyroxene, titanite and garnet in crystlaline limestone which occurs with white pegmatite containing grains of pyroxene, titanite and black tourmaline.

Part of 31 G/12W



Map 2

Cantley area

1. Foley Mine
2. Nellie and Blanche Mine
3. Blackburn Mine
4. McLelland Mine
5. Coté quarry
6. Dacey Mine

10.7 Cantley, at Junction St-Elizabeth Road.

13.3 Junction, on left, St-Andrews Road to McLelland Mine and Coté quarry.

13.7 Gravel pits, both sides of road.

15.1 Junction, on left, Holmes Road to Dacey Mine.

17.7 Wilson's Corners, at junction Townline Road to Horseshoe Mine.

17.9 Junction Highway 366 to Kitty Lynch, Kodak and Seybold Mines. The road log continues along Highway 307.

19.9 Junction, on left, to Laflèche Caverns.

21.0 Road-cut on right exposes crystalline limestone containing translucent green serpentine and light amber mica.

21.7 Junction, on right, road to Tenpenny Lake and to Lake Girard mine.

25.6 Junction, on right, to McGlashan Lake.

23.65 Road-cut on right exposes crystalline limestone containing green and amber serpentine, greenish blue massive chlorite, silvery amber mica, black tourmaline, actinolite, white hydrotalcite (nodular aggregates with satin to greasy lustre), and bluish grey spinel grains.

24.1 Road-cut on right is similar to the cut at km 23.65.

24.8 Turn-off (left) to Wakefield quarry.

25.2 Junction, on right, road to McGregor Lake and to Breckin Mine, Templeton quarry, and Seybold Mine.

25.7 Junction, on left, road to Gemmill and Deziel mines.

27.7 Turn-off (left) to St-Pierre-de-Wakefield quarry.

27.75 Junction, on left, alternate road to Leduc and McGlashan mines.

31.8 Junction, on left, road to McGlashan and Leduc mines, and Lachaine quarry.

38.3 Junction, on right, road to Evans - Lou Mine.

Foley Mine

BARITE, FLUORITE, CALCITE, DOLOMITE, GALENA, CHALCOPYRITE, SPHALERITE, PYRITE

In crystalline limestone

White massive barite occurs in a vein with light green fluorite, calcite and brown dolomite. Small patches of galena, chalcopyrite, sphalerite and pyrite are associated with the barite.

The vein was worked for barite from 1900 to 1903 by the Canada Paint Company which recovered 1521 t of ore valued at approximately $10,000. The openings consist of a 61 m trench on the north side of the Denis Road, a 46 m trench on the south side of the road and a shaft at the end of the northern cut. The openings are overgrown with cedar trees. The deposit is on the property of Mr. G. Clermont.

Road log from Highway 307 at km 5.0 (see page 12):

km 0.0 Turn right onto Denis road.

0.5 Fork; bear left.

1.4 Foley Mine trenches on both sides of road. (This is about 30 m beyond the Clermont barn on the right.)

Refs.: 43 pp. 47-48; 59 p. 16; 60 p. 31; 61 p. 8; 62 p. 64; 78 pp. 56-57.

Maps (T): 31 G/12 Wakefield
(G): 1508A Ottawa – Hull, Ontario and Quebec (G.S.C., 1:125 000)

Nellie and Blanche Mine

MICA, APATITE, SCAPOLITE, PYROXENE, TOURMALINE, ACTINOLITE, TREMOLITE

In pyroxenite

Dark amber mica is associated with light green apatite, greenish white to light yellow-green scapolite, dark green pyroxene, and black tourmaline in salmon-pink calcite. Scapolite is abundant and, when weathered, it has a greyish white woody appearance. Actinolite occurs in the pyroxenite. Tremolite is found as colourless to white acicular crystals in cavities with pyroxene in pink pegmatite.

Prior to 1890, the deposit was worked for apatite by Mr. J.T. Haycock of Ottawa. In 1892 the property was taken over by the Lake Girard Mica Mining System, a company set up by Mr. T.J. Watters of Ottawa to develop mica properties. The company controlled over 1214 ha of mica-bearing properties in Ontario and Quebec and operated mica shops on Besserer Street in Ottawa. Numerous mines, including the Nellie and Blanche Mine, were operated by the company until its liquidation in 1896. At one time 40 to 50 men were employed at the Nellie and Blanche Mine. It was worked by several pits, the largest reaching a depth of 15 m. It was last operated in 1925-26 by W. Ahearn of Ottawa. Large dumps lie adjacent to the pits in a wooded area just west of a sand pit on the Romanuk Road.

Road log from Highway 307 at km 7.2 (see page 12):

km		
	0.0	Turn left onto Romanuk Road.
	1.6	Junction old road on left just east of a sand pit on left side of road. Walk south along this road about 73 m to a fence; turn right and follow a trail along the fence for about 205 m to the mine.

Refs.: 43 pp. 31-32; 73 pp. 94, 96; 79 p. 58

Maps (T): 31 G/12 Wakefield
(G): 1508A Ottawa – Hull, Ontario and Quebec (G.S.C., 1:125 000)

Blackburn Mine

MICA, APATITE, ACTINOLITE, CALCITE, PYROXENE, TITANITE, TOURMALINE, GRAPHITE, PYRITE, FLUORITE

In pyroxenite

Amber mica, light green apatite (both massive and crystals), and dark green actinolite are the most abundant minerals in the deposit. They occur in compact, salmon-pink calcite. Also present in the calcite are titanite as nut-brown masses about 2 cm across, and black tourmaline. Graphite, pyrite, fluorite and red apatite are relatively uncommon.

The mine, also known as the Gemmill, Nellis, Vavasour or Cantley Mine, was first worked for apatite from 1878 to 1884 by Mr. Donald Gour of Cantley. It was subsequently worked for mica and apatite and more recently for mica only. The deposit is notable for the excellent quality of the mica produced from it. Operators have included Messrs. Nellis and Gemmill, the Vavasour Mining Association, and most recently, Blackburn Bros., Limited who worked the mine from 1936 until it was closed in 1964. Since about 1940 this mine was the principal mica producer in the province. The original

workings consisted of numerous pits, renches and drifts to a depth of 55 m. Recent operations were from 3 drifts serviced by a 33 m main shaft and, for a short time, from a 23 m shaft located 91 m west of the main shaft. Processing plants were originally located in Ottawa and Perkins Mills (Val des Monts), and more recently, at the mine site. The mica was sorted by hand underground, then processed at the plant. In 1943 the steam hoist was replaced by electrical equipment. The closing of this mine marked the end of mica mining in the Gatineau-Lièvre district. The shafts have been fenced, but specimens are available from the nearby dumps.

Access to the mine is via 0.8 km road leading west from Highway 307 at km 10.0 (see page 12).

Refs.: 9 pp. 39-40; 68 p. 159; 73 pp. 97-98; 94 p. 96; 95 p. 162

Maps (T): 31 G/12 Wakefield
(G): 1508A Ottawa – Hull, Ontario and Quebec (G.S.C., 1:125 000)

McLelland Mine

APATITE, MICA, PYROXENE, TITANITE, HORNBLENDE, CALCITE, EPIDOTE, ZIRCON, FELDSPAR

In pyroxenite

This is a former apatite-mica producer. Several varieties of apatite in both massive and crystal form are present in the dumps: sea-green and pinkish red crystals, in some

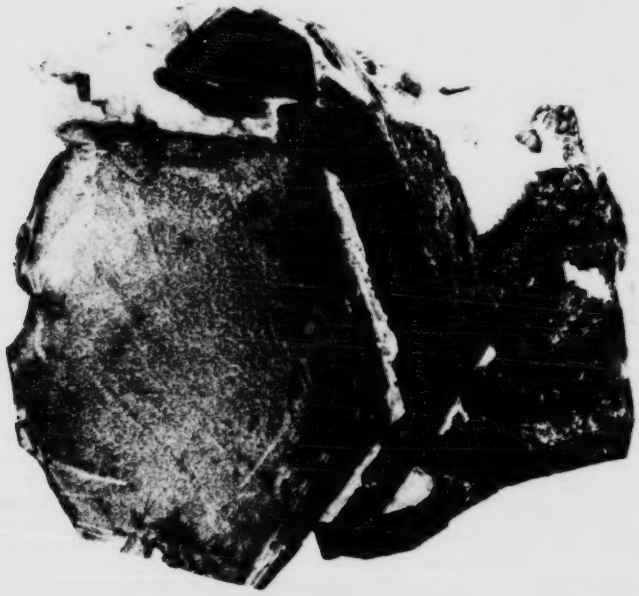


Plate II

Phlogopite crystals in calcite, Blackburn Mine. (Approximately actual size). (GSC photo 201184-F)

crystals the two colours are present; greyish green to greyish brown masses; blue to greenish blue sugary masses enclosing clear blue crystals and a aggregates of crystals. Large crystals measuring 2-5 cm in diameter are common but it is difficult to obtain specimens from large blocks of calcite because of their friable nature. The apatite occurs with dark amber to almost black mica, and dark green to greyish green pyroxene in salmon-pink calcite. The mica was regarded to be of poor quality because of its dark colour, hardness, and its brittle, fractured nature. Small grains and crystals of titanite, black hornblende, yellowish green epidote and very tiny pink zircon prisms are found in white feldspar that occurs in the pyroxenite.

The deposit was worked for apatite from 1878 to 1883 by Mr.. Wilkinson of Ottawa. For a short period later it was worked for mica by Mr. R. McConnell of Toronto. The openings consist of several pits and an inclined 30 m shaft that is now fenced in. Specimens are readildy available from good-sized dumps. The mine is located on a wooded knoll on the Landry property.

Road log from Highway 307 at km 13.3 (see page 14):

km		
	0.0	Turn left onto the St. Andrews Road.
	0.8	Turn-off to Landry property; turn left.
	0.95	Landry summer house. The mine is just east of the house.

Refs.: 73 pp. 101-102; 77 pp. 86-87

Maps (T): 31 G/12 Wakefield
(G): 1508A Ottawa – Hull, Ontario and Quebec (G.S.C., 1:125 000)

Coté Quarry

FELDSPAR, QUARTZ, PERISTERITE, TOURMALINE, MICA, FLUORITE, HEMATITE, GRAPHIC GRANITE

In pegmatite dyke

Pink and pale green to white feldspar and quartz are the chief constituents of the dyke. White peristerite is fairly common but it contains small inclusions of black tourmaline, which detract from its use as a gemstone. Tourmaline as black crystal aggregates is abundant. Colourless mica, brownish red hematite and purple fluorite are less common. Pink graphic granite has also been found.

The quarry was worked in 1928-29 by Mr. A. Wallingford of Gatineau Point and in 1929 by Gatineau Feldspar Company of Hull. In 1948-49 the Wallingfords worked the mine and installed a sorting plant. The feldspar was shipped to Rochester, N.Y. The pit, at the top of a ridge, measures 27 m by 15 m and is 17.5 m deep. It is on the farm of Mr. J.P. Brunet.

Road log from Highway 307 at km 13.3 (see page 14):

km		
	0.0	Turn left onto St. Andrews Road.
	0.8	Turn-off to McLelland Mine; continue straight ahead.
	1.2	Brunet farmhouse. A partly overgrown mine road leads from the barn to the quarry, a distance of 1.6 km.

Refs.: 14 p. 36; 15 p. 46; 74 pp. 33-34; 80 pp. 64-65

Maps (T): 31 G/12 Wakefield
(G): 1508A Ottawa – Hull, Ontario and Quebec (G.S.C., 1:125 000)

Dacey Mine

MICA, APATITE, CALCITE, PYROXENE, PYRITE, ACTINOLITE, TOURMALINE, TITANITE, QUARTZ, SCAPOLITE

In pyroxenite

Silvery-amber mica and sea-green apatite were formerly mined from this deposit. They occur in salmon-pink to brick-red and, less commonly, white calcite. Well-formed mica crystals are common. Most of the apatite is compact to sugary massive; crystals averaging 1 cm across can also be found in the djmps. Light greyish green pyroxene, pyrite and actinolite are present in calcite and in the pyroxenite. Black tourmaline, dark brown titanite and green actinolite occur in white quartz. Translucent white scapolite has also been reported from the deposit.

The mine was originaly worked for apatite in about 1890, and later for mica (1900-1904). In the 1930s, it became an important mica producer and was operated by Mr. A.G. Martin of Ottawa. It was then known as the Martin Mine. In the 1950s apatite and calcite were extracted for use as stucco material. In 1960 it was operated by Suncrest Mines. The deposit was operated from several open pits extending approximately 137 m along the side of a ridge. The main pit measures 18.2 m by 6.1 m and is 15.2 m deep. Extensive dumps surround the openings.

Road log from Highway 307 at km 15.1 (see page 14):

km		
	0.0	Turn left onto the Holmes Raod.
	0.5	Junction; turn right.
	1.2	End of road at the John Holmes farmhouse from which a 460 m trail leads west across the field to the slope where the mine is located.

Refs.: 8 p. 47; 9 pp. 39-40; 43 pp. 32-33; 73 p. 102

Maps (T): 31 G/12 Wakefield
(G): 1508A Ottawa – Hull, Ontario and Quebec (G.S.C., 1:125 00)

Horseshoe Mine

MICA, APATITE, CALCITE, SCAPOLITE, PYROXENE, PYRITE, AMPHIBOLE, TITANITE, ZIRCON, FELDSPAR

In pyroxenite at its contact with gneiss

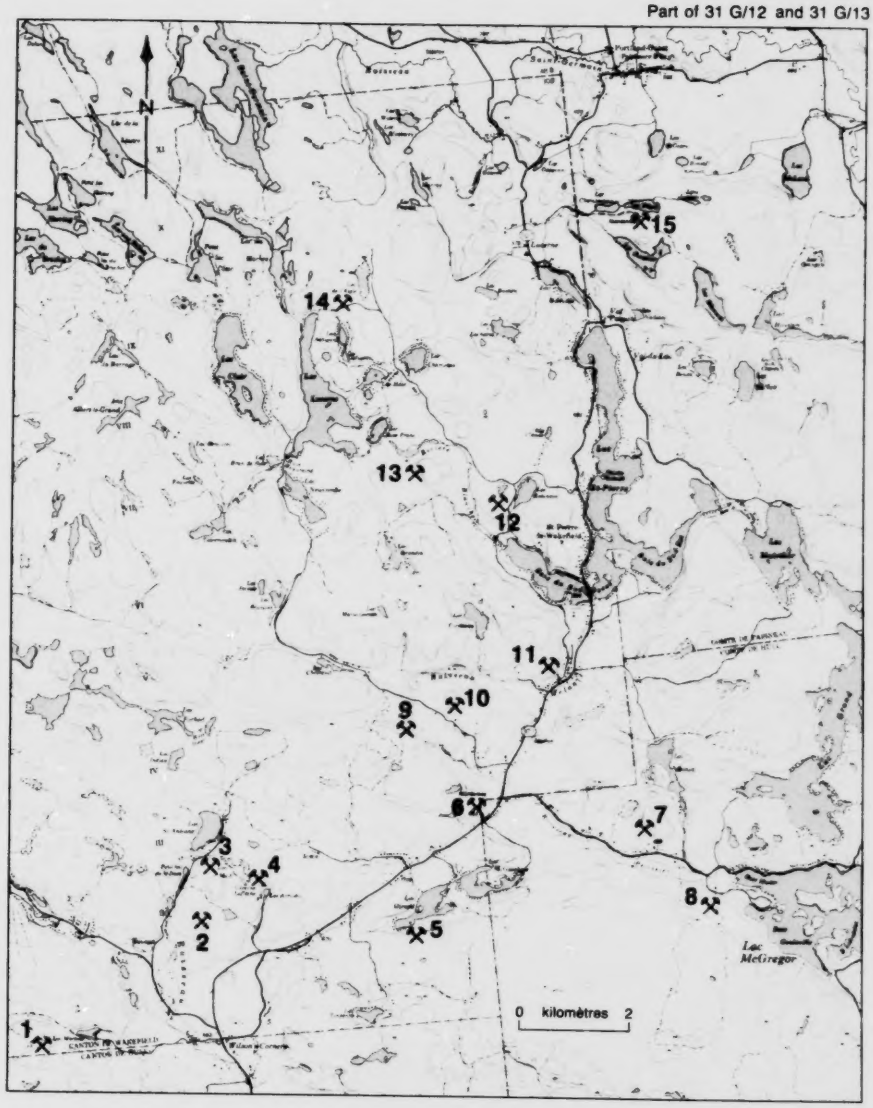
This former mica-apatite producer is notable for an abundance of translucent white columnar masses of scapolite. The weathered surfaces are chalk-white. When exposed to 'short' ultraviolet rays, it fluoresces bright pink. Some of the scapolite contains inclusions of mica and apatite making it unsuitable for lapidary purposes. Orange calcite encloses dark amber to almost black mica, green and blue apatite (massive and crystals), dark green pyroxene, and massive pyrite. Dark green amphibole, pyroxene and brown titanite are common in white feldspar. Pink zircon prisms about 3 mm long in feldspar are very rare.

The mine was worked for phosphate in the 1880s. From 1891 to 1892 the Lake Girard Mica Company undertook operations for mica. It was again operated as a mica deposit in 1909 and in 1937. The mine workings consist of a pit (now water-filled) and some adits at the top of a wooded ridge. Specimens are available from large dumps along the slope.

Road log from Highway 307 at km 17.7 (see page 14):

km		
	0.0	Wilson's Corners; turn left onto Townline Road.
	3.0	Fork at west end of small lake. Take the left fork and walk up the ridge for a distance of about 0.8 km to the mine.

Part of 31 G/12 and 31 G/13



Map 3

St-Pierre-de-Wakefield area

1. Horseshoe Mine
2. Kitty Lynch and Kodak Mines
3. Seybold Mine
4. Laflêche Cavern
5. Lake Girard Mine
6. Wakefield quarry
7. Breckin Mine
8. Templeton quarry
9. Gemmill Mine
10. Deziel Mine
11. St-Pierre-de-Wakefield quarry
12. McGlashan Mine
13. Leduc Mine
14. Lachaine quarry
15. Evans-Lou Mine

Refs.: 10 p. 42; 73 pp. 103-104

Maps (T): 31 G/12 Wakefield
(G): 1038 Région de Wakefield Area, Conté de Gatineau County (min. de l'Energie et des Ressources)

Kitty Lynch, Kodak Mines

MICA, APATITE, PYROXENE, CALCITE, TITANITE

In pyroxenite

Pink to cream-coloured calcite encloses amber phlogopite, bluish green apatite and dark greyish green pyroxene, all occurring as large crystals. Apatite crystals measuring 10 cm in diameter are common, while pyroxene crystals average 2 cm across and 5 to 8 cm long. Titanite is associated with pyroxene in a white pegmatitic rock.

The deposit was exposed by numerous pits along the west side and near the crest of a wooded ridge. Two mines were operated. The Kodak Mine consists of a shaft at the south end of the ridge 90 m southwest of the Kitty Lynch Mine. The latter was exposed by several pits, the largest measuring 30 m long and 10 m deep. The deposit was originally opened for apatite in 1880 by J.A. Wilson. Between 1890 and 1908 and again in 1936 it was worked for mica by various operators.

Road log from Highway 307 at km 17.9 (see page 14):

km		
	0.0	Turn left onto Highway 366.
	1.85	Fork; bear right onto road to Lac St-Antoine.
	2.2	Pits in woods on left (9 m from the road) expose pink calcite in pyroxenite. Mica, apatite and pyroxene are found in the calcite. Small grains of titanite occur in white pegmatite exposed in the pits.
	2.8	Junction mine road on right (at the P. Perrault cottage). The road leads up the ridge abot 0.5 km to the first pits. Others are located north and south and farther up the ridge.

Refs.: 9 p. 40; 73 pp. 88-90; 77 pp. 101-102

Maps (T): 31 G/12 Wakefield
(G): 1038 Wakefield area county (min. de l'Energie et des Ressources).

Seybold (Moore) Mine

APATITE, MICA, CALCITE, PYROXENE, PYRITE, TITANITE

In pyroxenite

Attractive smoky blue well-formed crystals of apatite are found embedded in salmon-pink calcite at this former mica-apatite mine. The crystals are 1 to 2 cm in diameter and several cm long. Light green and reddish apatite are also present. The mica is dark amber. Dark green pyroxene crystals are associated with the mica and apatite but they are not as abundant as at the Kitty Lynch Mine. Titanite, with pyroxene in white pegmatite, is common.

The mine was opened in 1880 for apatite by Mr. Isaac Moore of Ottawa. Within the next few years the mine yielded 455 t of phosphate. It was subsequentlly worked for mica and apatite (1889) by Messrs. Seybold and Gibson, and for mica only (1903) by Mr. McLean of Ottawa, and (1907) by Messrs. Holland and Moore. The openings consist of several pits (some cave-like) along the side of a ridge. The main pit measures 15.2 m by 3 m.

Road log from Highway 307 at km 17.9 (see page 14):

km		
	0.0	Turn left onto Highway 366.
	1.85	Fork; bear right onto road to Lac St-Antoine.
	2.8	Turn-off to Kitty Lynch and Kodak mines; continue straight
	4.6	Junction, on right, old mine-road. Follow this road for about 550 m to the mine near the top of a low ridge.

Refs.: 73 pp. 90-91; 77 p. 102

Maps (T): 31 G/12 Wakefield
(G): 1038 Wakefield area county (min. de l'Energie et des Ressources)

Laflêche Caverns

The Caverns, consisting of 3 chambers, are reached by a 176-foot tunnel. They are believed to have been formed in Pleistocene time. The largest chamber measures 30.5 m by 9.1 m and 2.7 to 6 m high. A steep stairway from which stalactites and stalagmites can be viewed, leads to the ceiling of one of the chambers. A subteranean lake, approximately 7.6 m across, connects with Lac Pelissier which is just east of the entrance to the Caverns. The interior of the Caverns has a year-round temperature of 7°C.

J. Dubois, a coureur-des-bois, discovered the caverns in about 1865 when he fell into a deep hole while hunting bears. He related the incident to M. Pelissier, mayor of St-Pierre-de-Wakefield, who later acquired the property. The cave was first described by Dr. Grant in 1869 (Ref. 19). In 1923, Attractions de Hull Limitée opened the caverns as a tourist attraction and in 1937 the enterprise was purchased by Mr. Z. Laflêche of Hull. Among those who paid official visits to the Caverns area: Lord Dufferin (1875), Lady Bing of Vimy (1923), Lady Willingdon (1929), and Lord Alexander of Tunis (1947).

A road 1.1 km long, connects the Caverns with Highway 307 at km 19.9 (see page 14):

Refs.: 19 pp. 71-73; 20 pp. 7-9; 43 p. 33

Maps (T): 31 G/12 Wakefield
(G): 1038 Wakefield area county (min. de l'Energie et des Ressources)

Lake Girard Mine

MICA, APATITE, PYROXENE, TOURMALINE, CALCITE, ACTINOLITE; TITANITE, QUARTZ

In pyroxenite; in pegmatite

In the early 1890s this was one of the most important mica producers in the district. Large sheets of very good quality silver-amber mica were recovered and were so abundant that smaller sheets (less than 5 cm by 8 cm) were discarded. These were later recovered when the dumps were reworked. Apatite which occurs with the mica is an attractive light green unlike the more common bluish green found at other deposits. The crystals average 2 cm in diameter. Bluish grey, well-formed crystals of pyroxene measuring up to 5 cm in diameter are commonly associated with the mica and apatite in calcite. Massive black tourmaline and dark green actinolite crystals are also relatively plentiful. Amphiboles occurs as bluish grey compact, fibrous masses resembling asbestos. The calcite is coarsely crystalline, cream-white with a pink tinge, and fluoresces a bright pink when exposed to ultraviolet rays (especially bright under 'short' rays). This is an uncommon characteristic since calcite in most other mica-apatite deposits in the Gatineau area does not fluoresce.

The mine was worked by underground methods to a depth of 64 m. The Lake Girard Mica System acquired the property in 1891 after it had been worked for a year. This company operated it until 1895 after which various concerns worked intermittently until 1904 and again in the early 1930s. The dumps were reworked in 1945.

The mine is located on the northern slope of a ridge overlooking the west and of Lac Girard. There is a large dump along the slope above the road and a small one at the road-side.

Road log from Highway 307 at km 21.7 (see page 14):

km		
	0.0	Turn right onto road to Tenpenny Lake and Lac Girard.
	0.15	Junction; turn left.
	0.95	Fork; bear right.
	1.3	Mine on right.

Ref.: 12 p. 38; 73 pp. 91-94, 287

Maps (T): 31 G/12 Wakefield
(G): 1038 Wakefield area county (min. de l'Energie et des Ressources)

Wakefield Quarry

FELDSPAR, QUARTZ, MICA, CHLORITE, ALLANITE, URANOTHORITE, PYRITE

In pegmatite

Pink microcline, white plagioclase and colourless to smoky quartz are the chief constituents of the pegmatite. Chlorite, mica, allanite, uranothorite and pyrite crystals (2 cm in diameter) occur in the feldspar but none of these minerals is abundant.

The quarry opening was made into the side of a wooded hill near its crest. The quarry measures 83.8 m by 15.2 to 22.9 m and is 15.2 m deep. One end of it has a cave-like opening supported by a pillar. The quarry is filled with water but specimens may be obtained from a dump below. The quarry was opened in 1942 by Canadian Flint and Spar Company Limited and was operated by the company for about 10 years.

Access to the quarry is via a single-lane, 0.4 km road leading north from the Highway 307 at km 21.7 (just east of a bridge).

Refs.: 11 p. 27; 43 pp. 35-37

Map (T): 31 G/12 Wakefield

Breckin Mine

APATITE, MICA, SCAPOLITE, ACTINOLITE, TITANITE, PYROXENE, PYRITE, FELDSPAR, ZIRCON, PREHNITE, FLUORITE, VESUVIANITE

In pyroxenite

This is a former phosphate mine. The apatite is blue to greenish blue massive; it is associated with some dark amber mica and with massive grey scapolite that contains, in places, inclusions of mica. Actinolite, titanite, pyroxene and pyrite occur in white feldspar associated with the apatite. Zircon, prehnite, fluorite and vesuvianite have also been reported from the deposit.

The mine consists of some small pits and an open-cut measuring 122 m by 3.6 m with a depth up to 9.1 m. The mine was operated for 2 years by Mr. Breckin in the early 1880s. High-grade apatite was recovered. The openings and dumps are now overgrown; they are on the crest and along the upper slopes of a wooded ridge on the property of Mr. Maurice Last.

Road log from Highway 307 at km 25.2 (see page 14):

km 0.0 Turn right onto road to Lac McGregor.

3.2 Turn left onto farm lane to Maurice Last house.

3.5 End of lane at house. Obtain permission to enter property. From the farmhouse, an old mine-road leads up the ridge for a distance of about 460 m to the mine.

Refs.: 77 pp. 98-99; 86 p. 12 GG

Map (T): 31 G/12 Wakefield.

Templeton Quarry

FELDSPAR, QUARTZ, TOURMALINE, GARNET, ACTINOLITE, MAGNETITE, PYRITE

In pegmatite

Pink to brick-red feldspar and colourless to white quartz are the principal constituents of the pegmatite. Black massive tourmaline and brownish red garnet (aggregates averaging 1 cm across) are common. Actinolite occurs as dark green bladed masses. Magnetite and pyrite are present but are not abundant.

The quarry is situated at the crest of a wooded ridge overlooking Lac McGregor. It was operated by Canadian Flint and Spar Company Limited in the early 1950s.

Road log from Highway 307 at km 25.2 (see page 14):

km 0.0 Turn right onto road to Lac McGregor.

4.3 Junction; turn right onto single-lane road.

4.7 Junction mine-road; turn right.

5.1 Quarry.

Map (T): 31 G/12 Wakefield

Plate III

Wakefield feldspar quarry.
(GSC photo 151341)

Seybold Mine

APATITE, MICA, CALCITE, PYROXENE, SCAPOLITE, TITANITE, PYRITE

In pyroxenite

Well-formed crystals of pyroxene and scapolite are reported to occur in pyroxenite at this former mica-apatite mine. Good crystals of greenish blue apatite (averaging 2 cm in diameter) and zoned crystals of phlogopite mica can be found in the dumps. Grains of titanite and pyrite occur in blue quartz that is associated with white feldspar.

The mine was operated during brief periods between 1880 and 1910 for apatite and mica. It consists of numerous small pits along the western slope of a ridge overlooking Lac McGregor. The largest pit measures 3.6 m in diameter and 12.1 m in depth. The openings and dumps are now partly overgrown.

Road log from the Highway 307 at km 25.2 (see page 14):

km		
	0.0	Turn right onto road to McGregor Lake.
	4.3	Junction to Templeton quarry; continue straight ahead.
	8.0	Junction road to Grand Lake; bear right.
	8.75	Hydro line crosses road. Walk up the hill along the hydro line to the top; then turn left toward the road and into the woods to the pits.

Ref.: 73 pp. 82-83

Maps (T): 31 G/12 Wakefield
(G): 1038 Wakefield area, Gatineau county (min. de l'Energie et des Ressources)

Gemmill Mine

SCAPOLITE, APATITE, TOURMALINE, PYROXENE, TITANITE, HEMATITE, CHLORITE, FELDSPAR, ZIRCON, EPIDOTE

In pyroxenite and gneiss

Scapolite is abundant in the dumps of this former apatite mine. It occurs as bluish white ot greyish green woody masses; the unweathered surfaces fluoresce pink when exposed to 'short' ultraviolet rays. Black tourmaline occurs in the scapolite. The apatite is sugary massive and ranges in colour from light green to purplish red. The red colour is due to very fine hematite inclusions. Dark green massive pyroxene is common and occurs with both scapollite and apatite. Small patches of hematite and chlorite occur in feldspar that is reddish due to iron. Zircon has been reported from the deposit. Epidote occurs in gneiss.

The mine consists of an adit that extends 45.7 m into a steep ridge on the north side of a ravine. It was operated from 1878 to 1886 by Messrs. Nellis and Gemmill; approximately 3630 t of apatite were produced. The mine is on the property of Emilien Levesque of Hull.

Road log from Highway 307 at **km 25.7** (see page 14):

km		
	0.0	Turn left onto gravel road.
	0.6	Junction; turn left onto single-lane road.
	1.5	Emilien Levesque Camp. Obtain permission to park here. A trail leads along the stream for a distance of about 70 m to the mine.

Refs.: 58 p. 134; 77 pp. 102-103; 87 p. 19L

Map (T): 31 G/12 Wakefield
(G): 1038 Wakefield area, Gatineau county (min. de l'Energie et des Ressources)

Deziel Mine

APATITE, MICA, CALCITE, PYROXENE, ACTINOLITE, FELDSPAR, TITANITE, PYRITE

In pyroxenite

Attractive, somewhat unusual crystals of apatite ranging in colour from light green to inky blue and to charcoal grey are found in pink to cream-white calcite. The crystals average about 1 cm in diameter and the colour gradation commonly occurs within an individual crystal. Amber mica and aggregates of greyish green pyroxene crystals (each averaging 2 cm across) are associated with the apatite. Dark green bladed aggregates of actinolite are abundant in white feldspar and in white calcite; in the feldspar, dark brown titanite crystals and a little pyrite are also present.

The mine consists of numerous pits on a wooded ridge. There are also several dumps from which specimens are available. The mine was worked in about 1960 for mica; it belongs to Mr. Alex Deziel of St-Pierre-de-Wakefield.

Road log from Highway 307 at km 25.7 (see page 14):

km	0.0	Turn left onto gravel road.
	0.6	Junction road to Gemmill Mine; bear right.
	1.3	Junction single-lane road; turn right.
km	1.5	Fork; bear left.
	2.4	End of road at shack. A trail leads a few m to the pits.

Map (T): 31 G/12 Wakefield

St-Pierre-de-Wakefield Quarry

FELDSPAR, QUARTZ, HORNBLENDE, CHLORITE, MICA, MAGNETITE, HEMATITE, PYRITE

In pegmatite

The deposit consists mainly of orange-red feldspar with white to smoky quartz. Accessory minerals include dark green hornblende, dark green to black chlorite, green mica, magnetite, hematite and pyrite.

The mine was opened for feldspar several years ago; it consists of an adit approximately 6 m long. The opening is visible from the road.

Access is via a single-lane road leading west for approximately 200 m from Highway 307 at km 27.7 (see page 14):

Map (T): 31 G/12 Wakefield

McGlashan Mine

APATITE, MICA, SCAPOLITE, CALCITE, PYROXENE, FELDSPAR, TITANITE, PYRRHOTITE, TREMOLITE, TOURMALINE, ZIRCON

In pyroxenite

Scapolite is relatively abundant at this former apatite-mica mine; it is massive and greyish blue in colour. Wilsonite occurs in some of the pits. Well-formed crystals of bluish green apatite and greyish green pyroxene are commonly associated with amber mica books in cream-white calcite. Massive apatite is also present. White feldspar contains titanite crystals, pyrrhotite, light green tremolite, black massive tourmaline, blue radiating acicular tourmaline aggregates, and tiny pink zircon crystals. Titanite crystals measuring up to 3 cm in diameter have been reported from the deposit. A blue iridescence was noted in some of the feldspar.

The deposit was worked by a series of pits on the southeast side of a hill overlooking Lac Saint Pierre. The largest pit measures 22.8 m by 4.6 m and 18.2 m deep. Mining for apatite and mica began in 1905 by Mr. R.W. Eady and 2 years later was taken over by Mr. R.J. McGlashan. The mica was cobbed at the mine and trimmed in shops at Wilson's Corners.

Road log from Highway 307 at km 31.8 (see page 14):

km		
	0.0	Turn left onto gravel road.
	1.6	Junction; turn left.
	1.9	Pits in woods on right, 14 m from road.
	2.1	Trail on right leads about 23 m to the large pit and to several small ones.

For alternate route, see page 33.

Refs.: 73 pp. 94-95; 77 page 33.

Map (T): 31 G/12 Wakefield

Leduc Mine

TOURMALINE, PERISTERITE, AMAZONITE, MICA, QUARTZ, FLUORITE, GARNET, URANINITE

In pegmatite

Tourmaline crystals occur in a pegmatite dyke consisting of microcline, albite, silvery grey mica and smoky quartz. The tourmaline crystals measure up to 5 cm in diameter and range in colour from yellow-green to dark bluish green and from pink to green and almost black. The green tones predominate. Most of the crystals, particularly the larger ones, are unsuitable for jewellery purposes due to their fractured nature. Apple-green amazonite and reddish peristerite are found in the deposit; the amazonite contains a few dark brown inclusions but pieces large enough for cabochons could be obtained. The peristerite is flesh-coloured and is not available in large specimens. Deep purple fluorite is common in the feldspar. Garnet and uraninite are relatively rare. During mining operations, large platy masses of mica measuring up to 35 by 70 cm were obtained.

The mine was originally opened in 1885 by Mr. L.H. Shirley for muscovite. About a tonne of mica was produced but it was then discovered that this was not muscovite. Analyses revealed that the mica is midway between lepidolite and zinnwaldite in composition.

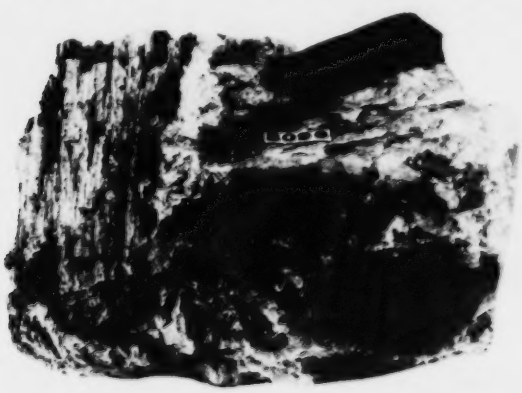


Plate IV

Tourmaline crystals in quartz, Leduc Mine. (Approximately actual size). (GSC photo 201184-D)

In 1908, M.J. O'Brien acquired the property in an attempt to mine gem tourmaline making this one of the few mines in Canada exploited specifically for gem material. The venture failed because of the fractured character of the material. The mine consists of a side-hill cut near the crest of a ridge. There is a large dump along the slope below the opening.

Road log from the Highway 307 at km 31.8 (see page 14):

km		
	0.0	Turn left onto gravel road.
	1.6	Junction road to McGlashan Mine; continue straight ahead.
	3.0	Junction single-lane road, on left, to cottage. Proceed about 50 m to the cottage. From the bridge behind the cottage, a wood-road leads to the top of the ridge, about 550 m. Bear left at all forks along this road to the top of the ridge. At the crest, there is another fork; turn right and continue along this trail for about 640 m to the southwestern edge of the ridge where the mine is located.

For an alternate route see following log.

Refs.: 23 pp. 239-240; 73 pp. 199-200; 74 pp. 42-43

Map (T): 31 G/12 Wakefield
(G): 1038 Wakefield area, Gatineau county (min. de l'Energie et des Ressources)

Alternate route to McGlashan, Leduc mines from km 27.75 of Highway 309 (see page 14):

km		
	0.0	Turn left onto road to St-Pierre-de-Wakefield church.
	3.5	Junction. To reach the McGlashan Mine continue straight ahead 0.8 km to the trail (on left) leading to the main pit. To reach the Leduc Mine, turn left onto the wood-road. This road becomes very rough beyond the cottages.
	5.3	Fork (just beyond swamp on right); turn right.
	5.5	Fork; bear left after crossing bridge.
	5.7	End of road. The dump is on the ridge above this point and is visible from it.

Lachaine Quarry

FELDSPAR, QUARTZ, MICA, FLUORITE, TOURMALINE, HORNBLENDE, GOETHITE, PYRITE, EUXENITE, BISMUTHINITE, BISMUTH

In pegmatite

The chief constituents of the pegmatite are white, pink and greenish feldspar and smoky quartz. Light green mica, purple fluorite, black tourmaline, hornblende, goethite and pyrite are common constituents. Euxenite is relatively uncommon. Bismuthinite (as steel-grey bladed aggregates) and native bismuth were at one time found in the feldspar, but were not seen at the time of this investigation.

The quarry consists of two openings; it is being worked for feldspar by Mr. R. Lachaine of St-Pierre-de-Wakefield.

Road log from Highway 307 at km 31.8 (see page 14):

km		
	0.0	Turn left onto gravel road.
	1.6	Junction to McGlashan Mine; continue straight ahead.

3.0 Turn-off to Leduc Mine; continue straight ahead.

4.3 Junction; bear right.

4.5 Junction; bear left.

5.2 Junction; continue straight ahead.

6.2 Junction; bear left.

6.7 Quarry on right.

Maps (T): 31 G/12 Wakefield
(G): 1038 Wakefield area, Gatineau county (min. de l'Energie et des Ressources)

Evans-Lou Mine

WAKEFIELDITE, CAYSICHITE, HELLANDITE, MONTMORILLONITE, CENOSITE, MARCASITE, FERGUSONITE, TENGERITE, LOKKAITE, QUARTZ, PLAGIOCLASE, MICROCLINE, BIOTITE, MUSCOVITE, ALLANITE, TITANITE, URANOTHORITE, TOURMALINE, PYRITE, XENOTIME, APATITE, EPIDOTE, GARNET, ZIRCON,

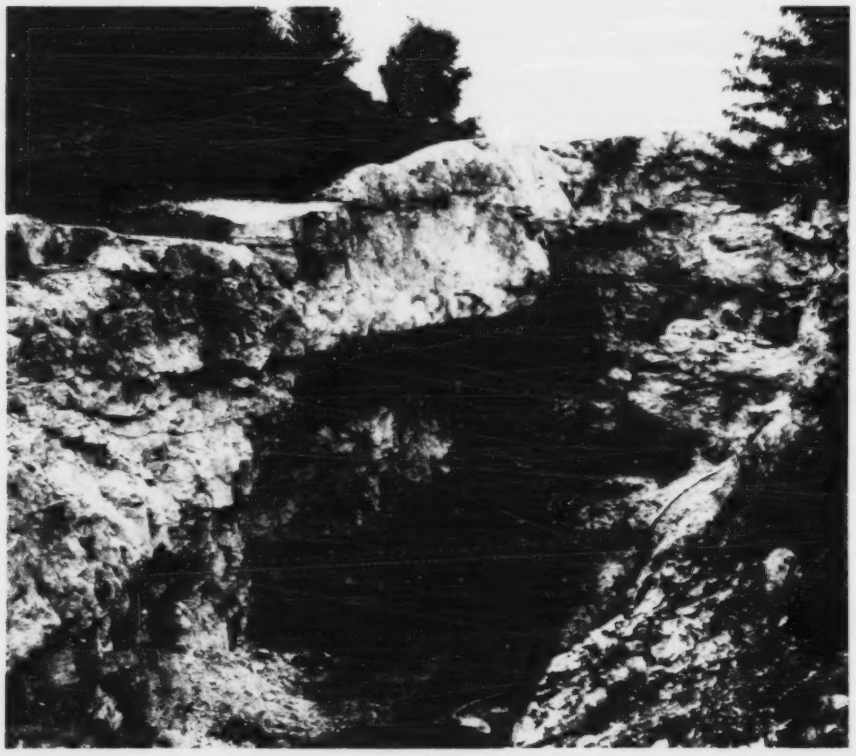


Plate V

Lachaine feldspar quarry. (GSC photo 151323)

CALCITE, URANINITE, PYROCHLORE, EUXENITE, ANATASE, HORNBLENDE, DIOPSIDE, ACTINOLITE, BISMUTH, CHALCOPYRITE, PYRRHOTITE, MOLYBDENITE, MAGNETITE, GRAPHITE, HEMATITE, GOETHITE, CHRYSOCOLLA, CHAMOSITE, DOVERITE, BISMUTHINITE, BISMUTITE, BEYERITE, JAROSITE, EULYTITE, GYPSUM, THOROGUMMITE, ZAVARITSKITE, URANOPHANE, BETA-URANOPHANE, MALACHITE, AZURITE.

In granite pegmatite.

Two new mineral species, wakefieldite and caysichite, were originally described from this deposit. Wakefieldite occurs as a yellow or tan powder on quartz and hellandite. Montmorillonite, cenosite and marcasite are associated with it. Caysichite is colourless to white and, less commonly, yellow or green and occurs as powdery coatings, divergent columnar masses with reniform surface and as radiating crystal aggregates. It coats fractures and fills cavities in quartz, feldspar and hellandite. Fergusonite, cenosite, tengerite and lokkaite are associated with it. These minerals occur in pegmatite composed of quartz (including large crystals), white and pink plagioclase and pink and green (amazonite) microcline. Accessory minerals found in the pegmatite include: biotite books (up to 60 cm in diameter), greenish muscovite books, large black allanite crystals (up to 120 cm by 60 cm), black to dark brown fergusonite prisms, black tourmaline prisms, pyrite cubes, yellow to green or pink xenotime crystals, blue apatite, epidote, black yttrian andradite garnet crystals, brown to black yttrian spessartite garnet, zircon, calcite crystals, hornblende, diopside, actinolite, uraninite cubes (up to 2 cm in diameter), brown earthy pyrochlore, dark brown resinous euxenite (tabular crystals), dull yellow anatase, native bismuth, chalcopyrite, pyrrhotite, molybdenite, magnetite and graphite. Hematite, goethite, montmorillonite and chrysocalla form coatings on quartz crystals. Hellandite occurs as yellow, brown to red or black crystals measuring up to 30 cm long. Small prisms of colourless or yellow to pink cenosite are associated with black granular massive chamosite on hellandite. White fibrous tengerite forms rosettes and spheres and is associated with fibrous lokkaite. Pink doverite crystals occur on tengerite. Bismuthinite and greenish yellow powdery beyerite are associated with native bismuth. Minerals forming encrustations or coatings on quartz include cream-white yellow to green bismutite, yellow jarosite, white eulytite, yellow to green or white thorogummite, white gypsum and yellow to grey zavaritskite. Yellow uranophane and beta-uranophane occur as fibres and radiating crystals. Malachite and azurite occur uncommnly as stains on the host rock.

The deposit was originally opened for feldspar in 1932 by B. Winning of Notre-Dame-de-la-Salette. It was worked from 1934 to 1936 by William E. Evans of Perth; the mine derives its name from Mr. Evans and his daughter Louise. Between 1938 and 1956, Canada Flint and Spar worked the deposit for feldspar and quartz. The quarry cuts into the side of a hill overlooking Edges Lake.

Road log from Highway 307 at km 38.3 (see page 14):

km		
	0.0	Turn right onto single-lane road to the S.A. Chamberlin property.
	0.3	Chamberlin farmhouse; obtain permission to proceed through their property.
	2.3	Fork; turn right.
	2.4	Quarry.

Refs.: 15 p. 45; 43a p. 69-77; 43b p. 293-298; 56a p. 395-410; 69 p. 37

Map (T): 31 G/13 Low

This is the last occurrence described for the side-trip along the St-Pierre-de-Wakefield Road; the main log along Highway 105 is resumed.

km	11.3	Chelsea, at junction to Old Chelsea, Meach Lake.

Old Chelsea-Gatineau Parkway Occurrences

Road log for side-trip to Old Chelsea and Gatineau Parkway. Underlined localities (see Map 1) are described in the text following road log.

0.0 Turn left onto road to Old Chelsea, Meach Lake.

2.2 Old Chelsea at junction Scott road to Chamberlin quarry.

2.35 Junction Gatineau Parkway to Kingsmere; turn right toward Meach Lake. A road-cut on the left side of the road exposes coarse red granite cut by veins of bladed white to pinkish barite with white calcite.

2.7 Turn-off (left) to Sweeney Mine.

3.2 Road-cut on left exposes granite cut by narrow barite-calcite veins.

3.4 Trail, on left, to O'Neill Mine.

3.7 Junction Gatineau Parkway; turn right.

4.5 Road-cuts, both sides of the Parkway, expose gneiss (last end of cut) and pyroxenite. Black tourmaline occurs in quartz (in gneiss) and in pink calcite (in pyroxenite); small titanite crystals, diopside and actinolite are also present in the calcite.

4.8 Road-cuts, both sides of the Parkway expose titanite and pyroxenite in white pegmatitic rock. Patches of yellow-green scapolite occur in greyish white woody scapolite that is associated with black tourmaline, mica and pyrite in dark green pyroxenite.

5.3 Lookout on left.

5.5 to 5.7 Road-cuts expose granite containing tourmaline, mica, pyrite and calcite.

6.5 Junction Meach Lake Road to McConnell Mine; continue along Parkway.

8.2 Road-cut on left exposes granite containing titanite crystals (small) and fluorite.

8.5 Road-cuts on both sides of the Parkway expose black massive garnet in pink pegmatite. Pyroxene and mica occur in crystalline limestone.

8.8 Road-cuts expose pink pegmatite containing small grains of titanite and pyroxene.

9.2 Fortune Lake, Artists Point Lookout on left. Titanite, pyroxene and mica are disseminated in pink calcite in the road-cut opposite the Lookout.

9.6 Road-cuts on right expose pink pegmatite containing radiating aggregates of actinolite.

10.6 Junction Ridge Road Trail.

10.9 Road-cut on right exposes pegmatite containing patches of titanite, magnetite and pyrite.

11.3 Junction Gatineau Parkway to Champlain Lookout.

Note: Parking is prohibited along the Parkway; automobiles may be parked at the parking areas included in the log.

Chamberlin Quarry

FELDSPAR, QUARTZ, TOURMALINE, PYRITE

In pegmatite

Buff to grey microcline and quartz are the principal components of the pegmatite. Small cavities in the feldspar and quartz are lined with transparent quartz crystals. Tourmaline and pyrite are conspicuous accessories. The quarry was worked for 3 months in 1898. It measures 18 by 6 m and is 3 m deep. The quarry and dumps are partly overgrown.

Road log fro km 2.2 at Old Chelsea (see page 30):

km 0.0 Turn right onto Scott (Tenaga) Road.

0.8 Turn right to old gravel pit and park. Walk up the hill on right to the quarry which is on the north side of the hill overlooking a ravine.

Ref.: 74 pp. 32-33

Map (T): 31 G/12 Wakefield
(G): 7-1970 Gatineau Park – Parc de la Gatineau, Quebec. (G.S.C., 1:15 000)

1508A Ottawa – Hull, Ontario and Quebec (G.S.C., 1:125 000)

Road-cuts along Gatineau Parkway

Road-cuts along Gatineau Parkway from km 2.35 (see page 30):

km 0.0 Junction Parkway and Meach Lake Road; turn left (south) onto the Parkway.

0.9 Road-cuts (both sides) expose crystalline limestone containing mica, pyroxene and titanite. Molybdenite flakes occur in pyroxenite. Black tourmaline and black submetallic betafite occur in white pegmatite.

1.3 Road-cuts, both sides of the Parkway, expose crystalline limestone and white pegmatite. Bright green pyroxene, pyrite, graphite, mica, apatite, titanite and tremolite occur in the limestone, and titanite, hornblende, tourmaline and blue apatite (rare) are found in the pegmatite.

1.5 Road-cut on right exposes white pegmatite containing titanite, pyrite, pyroxene and molybdenite. White gypsum forms an encrustation on the rock.

1.6 Turn-off to Penguin Picnic Field.

1.9 Turn-off to Kingsmere.

2.8 Road-cut on right. Stubby black crystals of tourmaline (averaging 1 cm in diameter) occur with mica and pyrite in white pegmatite. Irregular patches and veinlets of bright red jasper were noted in pyroxenite. Secondary minerals have formed encrustations on the pegmatite and on gneiss; the minerals include white gypsum, dull yellow powdery jarosite and bright yellow botryoidal copiapite.

4.2 Junction Hermit Trail to Pinks Lake. Tourmaline and pyrite occur in red pegmatite in the road-cut at the junction.

4.5 Road-cuts expose black tourmaline and pyrite in pegmatite (left side of the Parkway), and a pyroxenite containing calcite, mica and pyroxene (right side).

4.8 Junction Gatineau Parkway to Champlain Lookout (the occurrences along this part of the Parkway are described on page 1 to 10).

Sweeney Mine

APATITE, MICA, CALCITE, HEMATITE; FLUORITE, PYRITE, TITANITE, PYROXENE

In pyroxenite; in pegmatite

Massive light green to reddish apatite occurs with dark amber phlogopite in pink calcite; apatite crystals can also be found. The apatite contains inclusions and thin films of hematite which produces the reddish colour. Purple fluorite, colourless platy calcite, titanite, pyroxene, and pyrite occur in red pegmatite which contains cavities lined with tiny zircon crystals.

The deposit was originally operated for phosphate by Mr. John Sweeney of Old Chelsea, and later (1910) was worked for mica by the Kent Bros. of Kingston. The mica was found to be of a poor quality and operations were soon discontinued. The workings consist of a few shallow pits along a wooded ridge overlooking the Gatineau Parkway. The dumps are moss-covered and partly overgrown.

Road log from Meach Lake Road at km 2.7 (see page 30):

km		
	0.0	Turn left onto single-lane road.
	0.25	End of road. Proceed a few yards in the same direction to the junction of the Ridge Road trail. Turn right onto the trail and continue for about 365 m to the pits on the right side of the trail which at this point parallels the Gatineau Parkway.

Refs.: 73 pp. 110-111; 77 p. 83

Maps (T): 31 G/12 Wakefield
(G): 1508A Ottawa – Hull, Ontario and Quebec (G.S.C., 1:125 000)

O'Neill Mine

APATITE, MICA, CALCITE, CHLORITE, JASPER

In pyroxenite

Attractive maroon-red crystals of apatite are found with silvery amber mica in pink calcite. The crystals are well-formed and average 1 cm in diameter. Light green and pinkish apatite is also present in the dumps. Dark green patches of chlorite were noted in white massive calcite and a specimen of red jasper with white and yellow blotches was found in a granitic rock.

The mine consists of a pit 7.6 m deep, which was worked in 1903 for mica by Mrs. J. O'Neill of Old Chelsea. The opening and dumps are now overgrown.

Access to the mine is via a trail that leads south from the Meach Lake Road at km 3.4 (just before the bridge over a brook). Proceed about 60 m along the tail to a clearing with remnants of an old building on the left side. The pit is in the woods to the left (east) of this point. The foundation of the building was partly constructed of the calcite that is found at the mine.

Ref.: 73 p. 111

Maps (T): 31 G/12 Wakefield
(G): 1508A Ottawa – Hull, Ontario and Quebec (G.S.C., 1:125 000)

McConnell Mine

MICA, APATITE, PYROXENE, TREMOLITE, ZIRCON, TITANITE, PYRITE

In pyroxenite; in pegmatite

Amber mica is associated with reddish and sea-green apatite crystals in pink calcite. The crystals are commonly 1 to 2 cm in diameter. Similar-sized crystals of greyish green pyroxene and aggregates of light green tremolite are also found in the calcite. Tiny pink zircon prisms (averaging 3 mm long) occur with dark brown titanite, dark green pyroxene and pyrite in white pegmatite.

The deposit was worked briefly for mica about 75 years ago and again about 25 years ago. The workings consist of several shallow pits, now overgrown, in a wooded gentle slope near a swamp. The dumps are moss-covered.

Road log from km 6.5 on Gatineau Parkway (see page 30):

km 0.0 Junction Meach Lake Road and Parkway; turn right onto Meach Lake Road.

0.15 Junction old road on right. Proceed down the ravine, across a dried-up brook; then follow the trail along the base of the ridge to the junction of a trail on right. (This is approximately 500 m from the Meach Lake Road.) Turn right onto the second trail and proceed 182 m beyond a swampy area to the pits on a low ridge.

Ref.: 73 p. 112

Maps (T): 31 G/12 Wakefield
(G): 1508A Ottawa – Hull, Ontario and Quebec (G.S.C., 1:125 000)

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km 23.0 Junction road to Farm Point and to Cross and Maxwell quarries.

Cross Quarry

BRUCITE, SERPENTINE, TOCHILINITE, PEROVSKITE, LUDWIGITE, MAGNETITE, APATITE, MICA, CALCITE, AMPHIBOLE, GARNET, CHLORITE, HYDROTALCITE, HYDROMAGNESITE, PYROAURITE, PYROXENE, OLIVINE, SCAPOLITE, SPINEL, XONOTLITE, MESOLITE, VESUVIANITE, CLINOHUMITE, GEIKIELITE, SPHALERITE, GALENA, GRAPHITE, PYRRHOTITE, PYRITE, EPIDOTE, ACTINOLITE

In crystalline limestone at its contact with syenite

Brucite was until recently mined from this and from the Maxwell quarries. It occurs as colourless, white to grey, pearly to waxy nodules (1 to 5 millimetres in diameter) and, less commonly, as colourless to pale green foliated, platy or flaky aggregates and as fibrous veinlets in white crystalline limestone. The nodular variety is difficult to distinguish from the enclosing limestone due to its similar colour; on the weathered surfaces, however, the brucite becomes chalk-like and is readily identified. Serpentine is the most common impurity. It is masive in shades of light to dark green and yellow-green, dark red to brown, bluish green, black and amber-pink. Attractive specimens of white marble, banded, speckled and blotched with serpentine of various colours can readily be found and can be used for ornamental purposes. Fibrous serpentine (chrysotile) veins in the massive variety are present but are rare.

A conspicuous mineral in the serpentine marble is tochilinite which, as finely disseminated grains, forms black bands and crenulations in the rock. It also occurs as coatings on nodules of brucite, pyroaurite and serpentine, as irregular veinlets in serpentine and calcite, as nodules and flaky or fibrous aggregates, and as small granular masses. Perovskite, ludwigite and magnetite are associated with the tochilinite.

Other minerals occurring in the marble are: orange-brown and light green massive apatite, brown mica, grey to pink coarsely crystalline calcite, greyish green amphibole, dark brown garnet, dark green flaky chlorite, grey hydrotalcite nodules, colourless platy hydromagnesite, white to blue pyroaurite, dark green pyroxene, black olivine crystals

altered to serpentine and colourless to light yellow olivine, grey scapolite, green and pink spinel, light yellow vesuvianite, yellow clinohumite, white fibrous to columnar xonotlite, white acicular mesolite, geikielite, sphalerite, galena, graphite, pyrrhotite and pyrite.

Epidote, chlorite and actinolite occur in the syenite.

The property was operated by Aluminum Company of Canada Limited for brucite from 1959 until 1968. Permission to visit the deposit may be obtained from the Municipality of West Hull.

For directions to reach the quarry, see the road log to the Maxwell quarry.

Ref.: 43 pp. 37-38

Maps (T): 31 G/12 Wakefield
(G): 1508A Ottawa – Hull, Ontario and Quebec (G.S.C., 1:125 000)

1038 Wakefield Area, Gatineau County (min. de l'Energie et des Ressources)

Maxwell Quarry

BRUCITE, SERPENTINE, MICA, APATITE, CALCITE, OLIVINE, PYROXENE, TITANITE, TOURMALINE, PYROAURITE, CLINOHUMITE, VESUVIANITE, ARAGONITE, HYDROMAGNESITE, HYDROTALCITE, PEROVSKITE, GEIKIELITE, PERICLASE, ARTINITE, CELESTINE, SPHALERITE, RUTILE, ILMENITE, GALENA, VALERIITE, MAGNETITE, PYRITE, PYRRHOTITE, TOCHILINITE, LUDWIGITE

In crystalline limestone enclosed in syenite

This deposit is similar to that at the Cross quarry except that the brucite nodules are, in general, somewhat smaller. Serpentine, in a variety of patterns and colours (yellow, green, blue, red, brown, black and white) is very abundant. A pyroxenite zone between the limestone and the syenite country rock encloses pink calcite that contains mica and apatite; these minerals also occur in the limestone. Amber, light green and black micas are present. Apatite is common as large crystals and in massive form; it varies in colour from colourless to grey, green, amber, orange and brown. Dark green pyroxene crystals occur in the pyroxenite. Black olivine (forsterite) crystals replaced by serpentine occur in calcite. Granular diopside in tones of white, light green, sky-blue and mauve is found in serpentine. Minerals occurring in the crystalline limestone include: titanite, black tourmaline, pyroaurite as white, pink, grey and blue nodules, yellow clinohumite, light yellow vesuvianite, white radiating aragonite fibres, hydromagnesite as nodules and flaky aggregates, white hydrotalcite nodules, black lustrous perovskite, geikielite, periclase, artinite, celestine, sphalerite, rutile, ilmenite, galena, valeriite, magnetite pyrite and pyrrhotite. Tochilinite occurs as coatings partially replacing pyroaurite, brucite, pyrrhotite, serpentine and fibrous calcite. Ludwigite, as black acicular prisms, is associated with tochilinite.

The Wakefield brucite deposit was discovered in 1938 by Mr. M.F. Goudge, Canada Mines Branch, who identified a specimen submitted to him from the property of Mr. S.L. Cross of Farm Point. Operations of the Maxwell quarry and of the adjacent processing plant commenced in 1942 and were suspended in 1968.

Most of the quarry is inaccessible due to water at the bottom level. The steep quarry walls are exposed and the relation between the brucitic limestone, the pyroxenite and the syenite country rock can be observed. Extensive dumps in the vicinity of the pit are accessible and permission to visit them must be obtained from Mr. Mervin Morrison of Wakefield.

Road log from Highway 105 at **km 23.0** (see page 33):

km	
0.0	Turn right onto road to Farm Point.
3.95	Turn-off (left) to the Cross quarry.
6.3	Turn-off (left) to the Maxwell quarry.

Refs.: 27 pp. 2, 7-11, 24; 28 pp. 67-69; 43 pp. 38-39; 48 pp. 86-90

Maps (T): 31 G/12 Wakefield
(G): 1508A Ottawa – Hull, Ontario and Quebec (G.S.C., 1:125 000)
1038 Wakefield Area, Gatineau County (min. de l'Energie et des Ressources)

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km **30.7** **Junction Highway 366 to Lusk Cave, Ross and Bain mines.**

Lusk Cave

The Lusk Cave consists of a 213 m sinuous channel with upper and lower chambers separated by a 15 m passage where the roof has collapsed. The subterranean streams that have formed the cave follow joint and bedding planes in the crystalline limestone which contains inclusions of pegmatite, biotite gneiss and pyroxenite. It enters from the east through a narrow 15 m passage to the upper chamber characterized by several roof windows about 6 m from the floor. The lower chamber is approximately 4.5 m long and in it rapids and waterfalls have formed where the stream flows over pegmatite ridges. Ponds of trapped water mark the western extremities of both chambers. Unlike the Laflèche cavern, this one is almost completely devoid of stalactites.

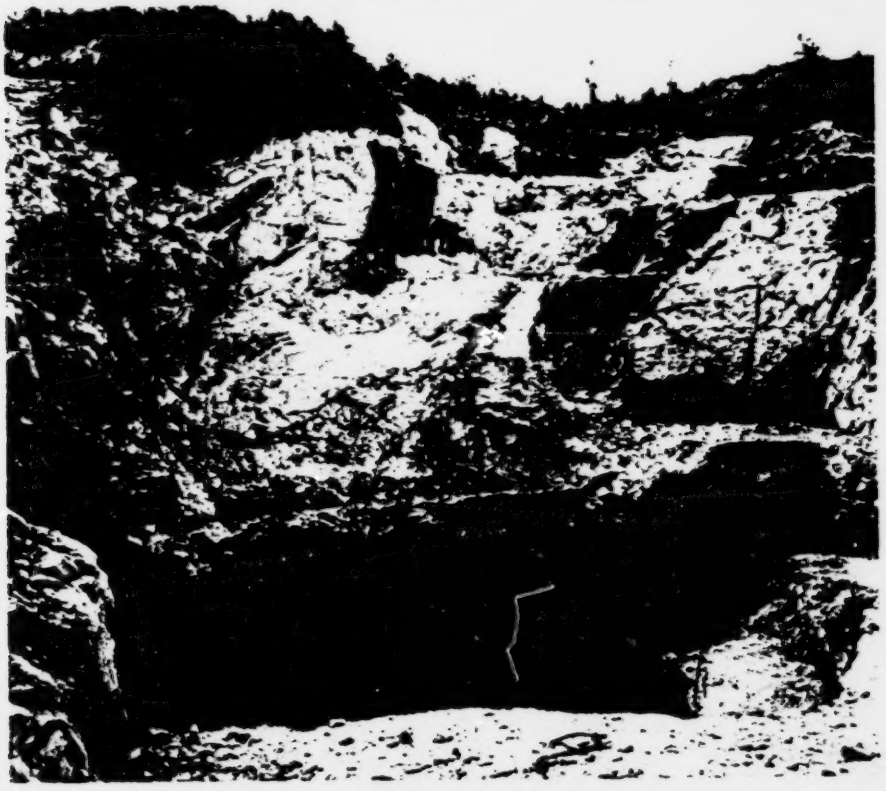

Plate VI

Maxwell brucite quarry, 1968. (GSC photo 151277)

Road log form Highway 105 at **km 30.7**:

km		
	0.0	Proceed along Highway 366.
	8.0	Junction; turn left onto road to Lac Phillippe.
	9.2	Road-cuts on both sides of road expose crystalline limestone containing grains of graphite, mica, pyrite, serpentine, amphibole (colourless and light green), apatite (blue), titanite, and pyroxene.
	16.4	Parking lot at end of Lac Philippe. The trail to Lusk Cave is on the right. Follow trail for 1.0 km to cave.

Refs.: 43 pp. 39-40; 49 pp. 100-105

Maps (T): 31 G/12 Wakefield
(G): 1508A Ottawa – Hull, Ontario and Quebec (G.S.C., 1:125 000)

Ross (Kert) Mine

MOLYBDENITE, PYROXENE, MICA, CALCITE, PYRITE, PYRRHOTITE, AMPHIBOLE, SCAPOLITE, TITANITE, FELDSPAR, GOETHITE

In pyroxenite

Museum-type specimens of molybdenite were at one time obtained from this mine. According to old records, in 1884 a local resident, Mr. R.H.G. Clapham, obtained five large specimens, one weighing 1.1 kg. Good crystals can still be found in the dumps. The molybdenite is associated with green granular pyroxene, phlogopite, calcite, pyrite, pyrrhotite, green bladed amphibole and white radiating, columnar aggregates of scapolite. Titanite crystals, commonly 1 cm long occur with pyroxene and molybdenite in white feldspar. Powdery goethite coats the specimens on the dumps.

The deposit was worked by a series of 11 pits, most of them very small. Approximately 63 t of ore were removed. The original staking of the deposit was done by Mr. C.G. Ross of Ottawa and the first operator was the Foote Mineral Company of Philadelphia which recovered 45 kg of museum-type specimens during a 2-month operation in 1894. During World War I, when the demand for molybdenite increased, the deposit was reopened by the Aldfield Mineral Syndicate and, later, by the Mining Corporation of Canada. The ore was processed by the Mines Branch in Ottawa. After the war, the mine was idle until 1939 when a Quyon group shipped 41 t of hand-cobbed ore to Ottawa. The pits and dumps are on the south side of a wooded ridge; they are now overgrown and rather difficult to find.

Road log from Highway 105 at **km 30.7** (see page 35):

km		
	0.0	Proceed along Highway 366.
	8.0	Junction Lac Phillippe road; continue straight ahead.
	15.8	Junction road to Duclos; turn right.
	17.2	Junction, turn right to Duclos.
	20.1	Duclos, at junction Para-Road; continue straight ahead.
	20.6	Junction; turn right to East Aldfield.
	24.3	Junction; turn right.
	25.1	Junction single-lane road (on right) to Bain Mine; continue on main road.
	25.2	Turn-off to farmhouse on right. Proceed along a partly overgrown trail that begins between the house and the barn and leads up the ridge. The largest pit is on the left side of the trail about 90 m north of the barn; another large pit is located 46 m west of it. Other pits are located about 90 m above and below these two.

Refs.: 22 pp. 140-141; 42 p. 47 T; 85 pp. 171-172; 90 pp. 85-86

Maps (T): 31 F/9 Quyon
(G): PR293 Onslow-Masham area, Pontiac and Gatineau counties (min. de l'Energie et des Ressources)

Bain (Indian Lake) Mine

MOLYBDENITE, PYRITE, PYRRHOTITE, PYROXENE, SCAPOLITE, TITANITE, CALCITE, MICA, CHABAZITE, FLUORITE, CHLORITE, ACTINOLITE, ROZENITE, URANINITE, URANOPHANE

In pyroxenite

Molybdenite occurs as flakes and aggregates with massive pyrite, pyrrhotite and pyroxene. Scapolite, as white radiating bladed masses is associated with green pyroxene (prismatic aggregates), dark amber mica, molybdenite, titanite, and calcite. Chabazite

Plate VII

Molybdenite crystals in pyroxenite, Ross Mine, (Actual size) GSC photo 201184-A.

occurs as tiny, pale yellow transparent crystals in cavities in scapolite. Fluorite, as small purple patches in massive pyroxene, is relatively uncommon. Other minerals in the deposit are chlorite, actinolite and rozenite (white encrustation on pyrite). Large crystals of pyroxene (5 to 8 cm long) were found with phlogopite in crystalline limestone in the pit near the mill-site. The rocks associated with the ore-bearing pyroxenite are pegmatite, crystalline limestone and hornblende-biotite gneiss. Uraninite and uranophane have been reported to occur in the pegmatite.

The original development of the property was done in 1917 by Mr. John Bain of Ottawa. Intermittent operations were conducted during brief periods by various operators from 1918 until 1939. A mill was constructed in the 1930s but only the foundation now marks the site. In 1953, the property was staked for uranium after radioactive minerals were discovered there. Most of the development work was done on the northwestern side of Indian (Janese) Lake, on the west side of the mill-site. Two large pits (one with a 9 m shaft) and two smaller ones are located there; they are up to 4.5 m deep. Small dumps lie adjacent to the pits. There are 3 shallow pits near the shore on the northeastern side of the lake 60 to 120 m south of the northern tip. The deposit is on the farm of Mr. M. Bouchier.

Road log from Highway 105 **km 30.7** (see page 35):

km	0.0	Turn onto Highway 366 and follow road log toward the Ross Mine.
	25.1	Turn right onto single-lane road.
	26.2	End of road at Bouchier farm buildings. At the barn, bear right and follow a partly overgrown road up a hill, then down toward a shack in the valley; at the shack the road curves to the right and leads to the mine. The distance from the barn is approximately 1.6 km. The road is rough and impassable by automobile.

Refs.: 22 pp. 138-140; 70 p. 6; 85 pp. 197-201; 90 pp. 82-85

Maps (T): 31 F/9 Quyon

(G): PR293 Onslow-Masham area, Pontiac and Gatineau counties (min. de l'Energie et des Ressources).

The main road log along Highway 105 is resumed

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km	**33.6**	**Junction to Wilson's Corners.**
	34.3 to 34.7	**Road-cut (on left) along highway bend exposes granitic rocks at each end with crystalline limestone and pyroxenite in between. Serpentine, pyrite, hydrotalcite, actinolite and titanite occur in the limestone.**
	35.4	**Road-cut on left exposes crystalline limestone containing pyroxene, mica, pink calcite, humite (yellow to orange granular patches), graphite, pyrite, titanite and feldspar.**
	37.0 37.25 37.5	**Road-cuts on left expose crystalline limestone, white pegmatite and some pyroxenite. Graphite, pyrite, mica, pyroxene and titanite are finely disseminated in the limestone which also contains aggregates of actinolite. Black tourmaline and blue quartz were noted in the pegmatite at km 37.0. Pink calcite is common in the exposure at km 37.25.**
	38.0	**Alcove, at junction to Rupert, Lascelles.**
	38.1	**Road-cut on left. Epidote occurs as granular streaks and patches associated with red feldspar in granitic rock that is cut by white quartz bands containing pyroxene crystals.**

38.8 Road-cut on left, at bend, exposes crystalline limestone and white pegmatite. Pyroxene, graphite, titanite, pyrite, apatite and serpentine occur in the limestone, brown tourmaline and deep blue apatite (rare) in the pegmatite.

41.5 Road-cut, on left. A few apatite crystals associated with pyroxene, pyrite and pink calcite were noted in the crystalline limestone exposure.

42.3 Road-cut on left. Mica, graphite, titanite and serpentine are finely disseminated in crystalline limestone.

43.9 Road-cut on left. Tremolite, titanite, serpentine, pink calcite and grey scapolite prisms (up to 4 mm wide) occur in crystalline limestone that is associated with white pegmatite containing pyroxene and titanite.

45.4 Farrellton, at bridge.

50.7 Road-cuts on left expose crystalline limestone containing graphite,
50.8 mica, blue apatite (rare), and amber-brown tourmaline.

54.1 Low, at junction to Martindale.

Denholme Mine

ASBESTOS, SERPENTINE, CALCITE, DOLOMITE, GRAPHITE

In crystalline limestone

Narrow veins of colourless, yellow and amber asbestos (chrysotile) occur with massive yellow, amber and olive-green serpentine in crystalline limestone at this former asbestos mine. White fibrous and columnar calcite resembling picrolite is common. Transparent, colourless crystals of dolomite occur with the calcite. Graphite is sparsely disseminated in the limestone.

The deposit is reported to have yielded high-grade asbestos. It was worked by Mr. J.W. Wurtelle of Ottawa for 2 or 3 years begining in 1898. Prior to shipment, the ore was treated at a grinding mill at the mine site. A shaft, now partly filled with water, and a small dump are the only remnants of former operations. They are located on the south side of a sparsely wooded hill on the farm of Mr. N. Fitzpatrick.

Road log from Highway 105 at km 54.1 (see above):

km

0.0 Turn right toward Low and Martindale.

0.15 Junction at Paugan Inn; turn right toward the Gatineau Power dam.

0.95 Road-cut on left exposes coarse crystalline limestone and pink pegmatite. Graphite, titanite, mica, pink calcite and orange-brown granular tourmaline occur in the limestone.

1.45 Road-cut on right exposes a coarse, pyroxene- and graphite-bearing crystalline limestone.

1.9 Junction; bear right.

3.7 Turn-off to the Fitzpatrick farmhouse on the left. The mine is in the pasture, approximately 320 m northwest of the farmhouse.

Refs.: 45 p. 20; 46 p. 16; 55 p. 5; 88 p. 231A

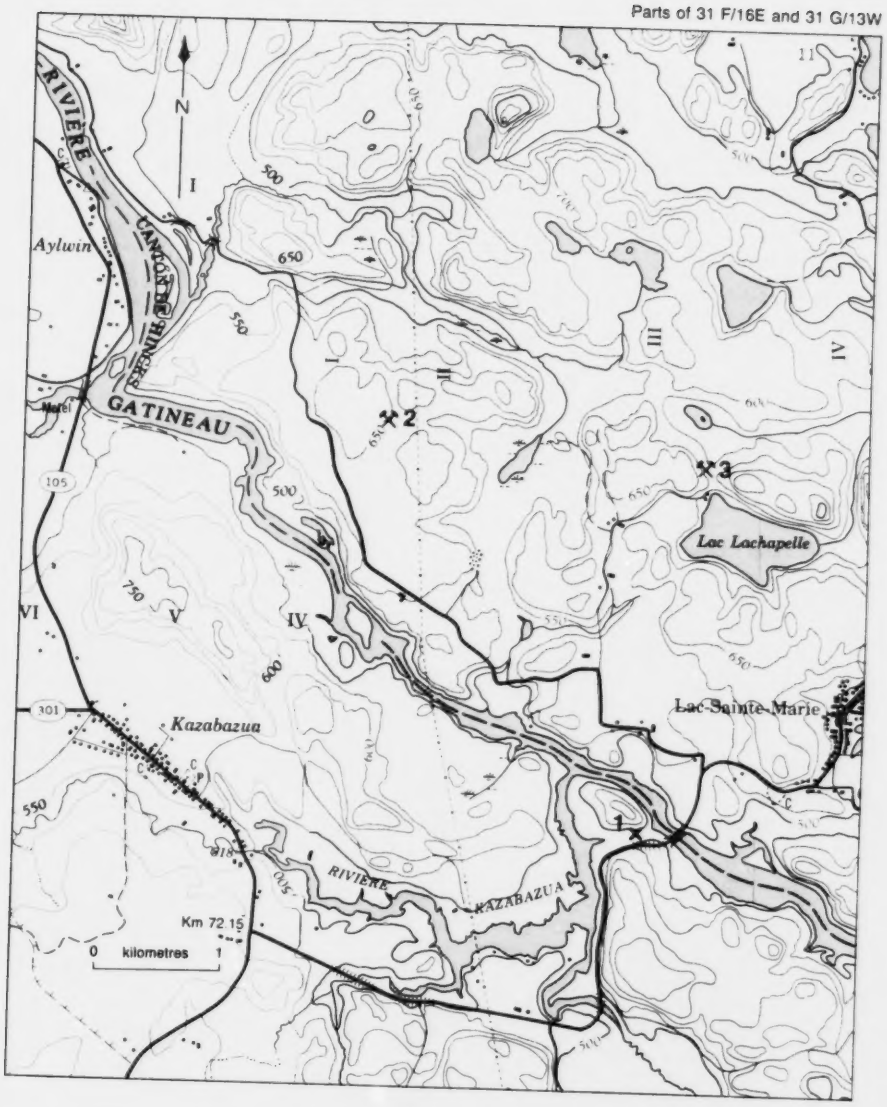
Maps (T): 31 G/13 Low
(G): PR235 Denholme-Hincks area, Gatineau County (min. de l'Energie et des Ressources)

km		
	56.1	Road-cuts expose crystalline limestone containing pinkish red calcite and disseminations of graphite and mica.
	56.6	Road-cut on right exposes pegmatite and coarse black amphibolite. Titanite crystals measuring 1 cm diameter occur in green pyroxene in the pegmatite.
	57.7	Road-cuts, both sides of highway. Crystalline limestone with disseminations of graphite, mica, pyroxene, pyrite, titanite, apatite and serpentine is associated with a small body of pink pegmatite in which are large crystals of pyroxene.
	60.6	Road-cut on right exposes grey banded crystalline limestone. Dark brown massive tourmaline is associated with graphite, mica, pink calcite, serpentine, and light brown amphibole in the marble.
	64.2	Junction, on left, road to Venosta Minerals property. A vermiculite deposit about 8 km west of this junction was exposed by stripping several years ago. It is not accessible.
	66.3 **67.3** **67.4** **70.3** **70.6** **71.3** **71.8**	Road-cuts. Graphite-bearing crystalline limestone is exposed in this series of road-cuts. Associated with it area: mica, pyrite, pyroxene, titanite, serpentine and yellow to light brown amphibole. Apatite occurs as blue grains (rare) in most of the exposures, and as attractive sky blue small crystals and masses in the cut at **km 71.8**. Grains and tiny crystals of mauve, grey, pink and black spinel were noted in the exposures at **km 66.3** and **67.4**. Orange-brown tourmaline (as granular aggregates) was found in the cuts at **km 67.4** and **71.8**, and grey massive scapolite at **km 66.3** and **71.8**. Grains of orange chondrodite form bands in the marble at **km 70.3**. Emerald green diopside enclosing dark amber phlogopite occurs at **km 71.8**, it is similar to but less coarse than the diopside at the Hastey Mine (see page 42).
	72.15	Junction road to Lac Ste-Marie.

Occurrences along Lac Ste-Marie Road

Road log for side trip along Lac Ste-Marie Road (localities described in text following this log are underlined):

km		
	0.0	Turn right onto Lac Ste-Marie Road.
	0.5	Road-cut on right exposes yellow-green serpentine with disseminations of graphite, pyrite, mica, blue apatite (rare), pink to light brown titanite, and epidote.
	1.1	Road-cut on left exposes crystalline limestone and white pegmatite. Mica, pyroxene, calcite, pyrite, apatite (blue and green), and amphibole (pale yellow) were noted in the limestone. Titanite crystals (averaging 5 mm in diameter) are associated with green pyroxene in the pegmatite.
	1.6	Road-cut on right. Pink calcite containing mica, pyroxene and tourmaline is associated with white pegmatite in which occur tourmaline, titanite, pyroxene and pyrite.
	4.6	Road-cuts on both sides of road (west side of Hincks Bridge), Kornerupine occurrence.
	4.9	Road-cuts on both sides of road (east side of Hincks Bridge). Garnet-sillimanite gneiss, pegmatite and crystalline limestone are exposed. Dark green pyroxene aggregates are associated with small grains of pyrite and titanite in the pegmatite. Tiny grains of apatite, pyrite and magnetite are scattered through the limestone.
	5.5	Junction road on left. This road leads to the Pritchard and Sparks Mine, and to the Hastey Mine.



Map 4

Lac Ste-Marie area

1. Kornerupine occurrence
2. Hastey Mine
3. Pritchard and Sparks Mine

Kornerupine Occurrence

KORNERUPINE, SILLIMANITE, GARNET, KYANITE, TOURMALINE, RUTILE, PYRITE

In biotite paragneiss

Prismatic crystals and irregular grains of dark green to almost black and also straw yellow kornerupine are associated with pink garnet and sillimanite-biotite paragneiss exposed by road-cuts at the Hincks Bridge. Crystals measuring up to 5 cm long and 1 cm wide have been reported. The garnet occurs as irregular aggregates averaging 1 cm in diameter. Clusters of white sillimanite crystals with the individual crystals about 5 mm across and 2.5 cm long are uncommon. Bladed aggregates of kyanite occur in the rock outcrops near the roadcut. Dark brown tourmaline, black lustrous rutile (tiny prisms), and pyrite occur sparingly in the paragneiss.

The kornerupine-bearing rock is exposed by road-cuts on both sides of the Lac Ste-Marie road on the west side of the Hincks Bridge over the Gatineau River, and in outcrops in the vicinity of the power line.

Ref.: 24 pp. 531-541

Maps (T): 31 G/13 Low
(G): 235 Denholme-Hincks area, Gatineau County (min. de l'Energie et des Ressources)

Pritchard and sparks Mine

MICA, APATITE, CALCITE, HORNBLENDE, PYRITE

In pyroxenite at the contact with crystalline limestone

Dark brown phlogopite occurs with a small amount of greenish blue apatite in pale pink to cream-coloured calcite. Lustrous black massive hornblende is very common and pyrite is sparingly present.

The deposit was worked briefly for mica between 1904 and 1909. The workings consist of a few shallow pits (up to 4.5 m deep) on the northwest side of a hill. Both the pits and dumps are now partly overgrown.

Road log from Lac Ste-Marie Road at km 5.5 (see page 40):

km 0.0 Turn left at junction.

1.3 Junction; continue straight ahead.

2.4 End of road at farm. Obtain permission to visit the mine which is located about 1.2 km northeast of the farm buildings.

Ref.: 73 pp. 119, 287

Maps (T): 31 G/13 Low
(G): 235 Denholme-Hincks area, Gatineau County (min. de l'Energie et des Ressources)

Hastey Mine

DIOPSIDE, PHLOGOPITE, SCAPOLITE, FELDSPAR, TITANITE, APATITE, ZIRCON, PYRRHOTITE, AMPHIBOLE, TOURMALINE

At contact pyroxenite and crystalline limestone

Diopside ranging in colour form emerald to dark green occurs as masses at this mine. Inclusions of dark amber phlogopite render it unsuitable for most lapidary purposes but

cabochons could, be cut from portions of the mineral that are free of mica. The property was formerly mined for mica which was obltained in sheets measuring up to 1.2 m across. Grey massive scapolite, feldspar, dark brown titanite (crystals averaging 1 cm long), greyish blue massive apatite and colourless to white calcite are associated with the pyroxene and mica. Small pink grains of zircon were noted in the scapolite. Pyrrhotite, light brown amphibole, and dark brown tourmaline occur in the crystalline limestone.

The mine was operated in the 1890s and in 1937 from two pits, now waterfilled and partly overgrown. Good specimens of diopside can be otained from the northeastern pit.

Road log from the Lac Ste-Marie Raod at km 5.5 (see page 40):

km		
	0.0	Turn left at junction.
	1.3	Junction; turn left (road straight ahead leads to Pritchard and Sparks Mine).
	4.7	Trail on right. Proceed east along this trail for approximately 185 m to a fork; turn left and continue 70 m to another fork turn left again and proceed 140 m to the first pit on the left side of trail. Continue along the trail for about 32 m to the second pit.

Refs.: 68 p. 167; 73 p. 119

Maps (T): 31 G/13 Low
235 Denholme-Hincks area, Gatineau County (min. de l'Energie et des Ressources)

This is the last occurrence described for the side trip along the Lac Ste-Marie Road; the main log along Highway 105 is resumed.

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km		
	72.7	Road-cut on right exposes graphite-bearing crystalline limestone.
	74.5	Kazabazua, at junction road to Danford Lake.
	76.1	Road-cuts expose white pegmatite containing pink garnet (5 mm grains), pyroxene and pyrite.
	77.1	Junction to Aylwin Station.
	77.15, 81.25	Road-cuts on left expose crystalline limestone containing graphite, apatite (light blue grains), mica, pyroxene, titanite, magnetite, pyrite and serpentine.
	81.7, 82.2	Road-cuts expose biotite gneiss containing grains and aggregates of pink garnet.
	85.3	Junction road to Marks.
	86.4	Junction to Chaibee Mine.

Chaibee Mine

MICA, APATITE, CALCITE, PYROXENE, FELDSPAR, TOURMALINE, SCAPOLITE

In pyroxenite

Phlogopite occurs with light green apatite (massive and crystals) in salmon-pink calcite. Dark green pyroxene crystals are common in the calcite. Other minerals associated with this former mica mine are pinkish white feldspar, black tourmaline and grey scapolite. The deposit occurs at the contact of a pyroxenite dyke and granite gneiss.

The mine was worked originally in the 1890s by the Lake Girard Mica Company. Subsequent operators included the Webster Company and the General Electric Company. The property was last worked in 1903. The openings consist of a 22.8 m shaft and several small pits. There is a large dump adjacent to the shaft. The mine is on the Lionel Emond farm.

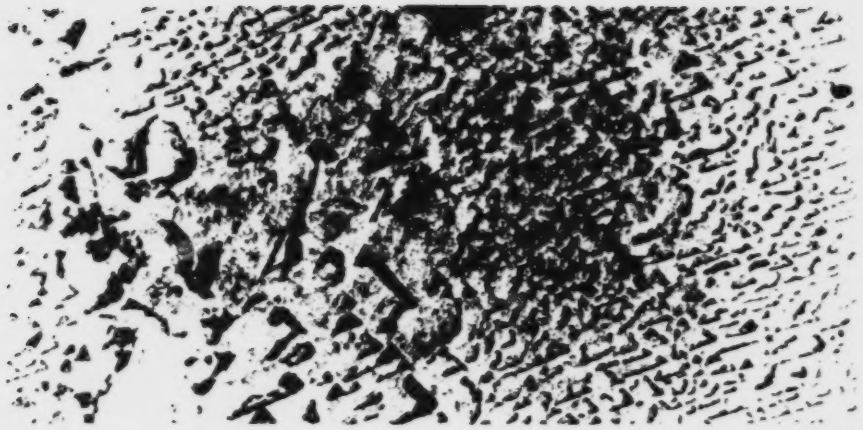

Plate VIII

Graphic granite, Blue Sea Lake quarry. (GSC photo 201184-B)

Road log from Highway 105 at **km 86.4** (see page 43):

km		
	0.0	Turn right (east) onto gravel road.
	3.7	Turn-off (right) to Lionel Emond farm. Obtain permission here to visit mine.
	4.2	Gate on right. The mine is in a wooded area about 45 m west of the gate.

Ref.: 73 pp. 121-122

Map (T): 31 K/1 Blue Sea Lake

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km		
	89.5	**Garnet, sillimanite, and kornerupine (small greyish green prisms) occur in biotite gneiss exposed by these cuts.**
	90.4	**Junction road to Lac Cayamant.**
	92.0	**Gracefield, at junction to Blue Sea Lake.**

Blue Sea Lake Quarry

GRAPHIC GRANITE, FELDSPAR, FLUORITE, TOURMALINE, MICA

In pegmatite

An attractive light blue graphic granite occurs at this quarry. It consists of feldspar and smoky quartz intergrowths producing hieroglyphic patterns. It takes a very good polish and can be used for decorative purposes. The quarry was opened for feldspar which is generally of a greyish green colour. Accessory minerals include purple fluorite, black tourmaline and biotite.

The quarry is now partly overgrown. Specimens can be found along the quarry walls and in the large blocks of rock on the floor of the quarry. The deposit was worked at the side of a hill for a short time about 75 years ago.

Road log from Highway 105 at Gracefield (km 92.0 see page 44):

km		
	0.0	Proceed along road to Blue Sea Lake.
	10.6 10.9	Road-cuts expose snow-white compact marble that contains sky blue grains and slender crystals of apatite, and some silvery amber mica.
	11.7	Blue Sea Lake at junction adjacent to church; turn left.
	12.4	Junction at gasoline station; turn left onto single-lane road.
	13.0	Quarry on wooded slope on right.

Ref.: 74 pp. 30-31

Map (T): 31 K/1 Blue Sea Lake

Moore Mine

MICA, APATITE, CALCITE, PYRITE

In pyroxenite

Large crystals of phlogopite and apatite occur in this former mica mine. The apatite crystals are greyish blue and measure up to 2 cm in diameter, and mica books measuring 15 cm across are relatively common. White calcite containing tiny pyrite grains is associated with the mica and apatite.

The mine is located on the Marc Carpentier farm southeast of Gracefield. One pit is about 182 m west of the farmhouse, another one about 365 m northwest of it. They were last worked about 75 years ago and both the pits and dumps are now partly overgrown.

Road log from Highway 105 at Gracefield (km 92.0 see page 44):

km		
	0.0	Turn right onto rue Principale.
	0.08	Turn right onto rue du Pont.
	0.8	Junction; turn right.
	3.3	Junction; turn right.
	6.35	Junction; continue straight ahead.
	7.3	Junction; bear right.
	8.3	Turn-off (right) to the Carpentier farmhouse.

Ref.: 73 pp. 122-123

Map (T): 31 K/1 Blue Sea Lake

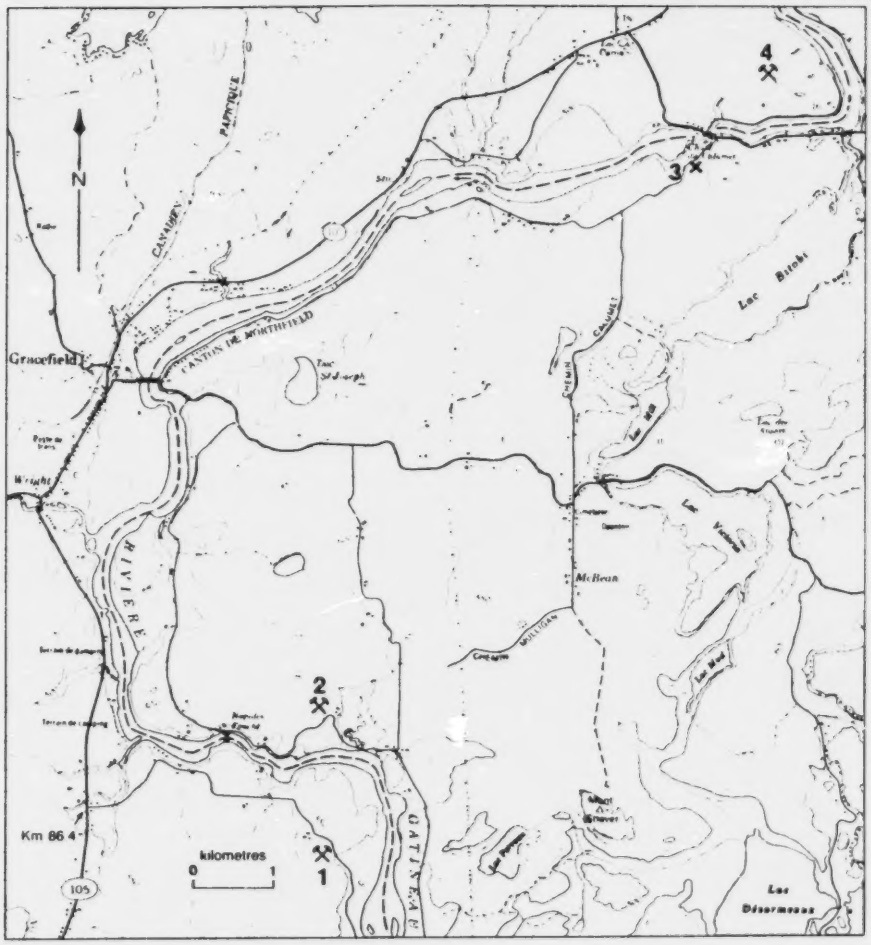
km		
	96.2	Road-cuts, both sides of highway expose titanite crystals (about 1 cm across) and pyroxene in white pegmatite and in crystalline limestone.
	98.6	Road-cut, on left, exposes biotite gneiss containing aggregates of pink garnet and colourless needle-like sillimanite.
	99.9	Junction road to Pointe-Comfort, Lac Bitobi.

Father Guay Mine

MICA, APATITE, PYROXENE, TITANITE, HORNBLENDE, PYRITE, SCAPOLITE, FELDSPAR

In pyroxenite at contact of crystalline limestone

Parts of 31 J/4W and 31 K/1E



Map 5

Gracefield area

1. Chaibee Mine
2. Moore Mine
3. Lac Bitobi zinc occurrence
4. Father Guay Mine

Phlogopite mica, formerly recovered from this property, is associated with blue apatite (as well-formed crystals and in massive form), dark green pyroxene and brown titanite in pale salmon-pink calcite. Hornblende, as lustrous black aggregates, is very common; it occurs with pyrite at the contact of the pyroxenite and marble. Pale yellow scapolite occurs as glassy patches with titanite and pyrite in grey feldspar.

The mine was opened by Father Guay of Gracefield in 1896; it was subsequently operated at short intervals by other groups until 1908. The openings consist of a large pit (71 m by 23 m) and several small pits and trenches. The pits and dumps are partly overgrown; they are on the farm of Rosaire Gauthier.

Road log from Highway 105 at km 99.9 (see page 45):

km		
	0.0	Turn right onto road to Pointe-Comfort.
	1.75	Fork; bear left.
	4.1	Gauthier farmhouse and end of road. Obtain permission to visit mine which is on the southeastern side of wooded hill about 0.8 km west of the farmhouse. An old mine-road leads to it.

Refs.: 4 p. 23; 73 pp. 124-125

Maps (T): 31 J/4 Bouchette
(G): 921 Trente-et-un-Milles Lake area, Gatineau, Labelle and Papineau counties (min. de l'Energie et des Ressources)

Lac Bitobi Zinc Occurrence

SPHALERITE, PYRITE, PYRRHOTITE, GALENA, PYROXENE, MICA, ROZENITE, GREENOCKITE, GRAPHITE, LIMONITE, MELANTERITE, APATITE, TREMOLITE

In crystalline limestone

Dark brown massive sphalerite occurs in a vein with pyrite, pyrrhotite, galena and pyroxene. White rozenite occurs as a botryoidal encrustation on the vein minerals. Mica and green pyroxene (partly altered to serpentine) are common in the crystalline limestone. Other minerals reported from the deposit are: greenockite, graphite, limonite, melanterite, apatite and tremolite. The vein is about 76 m long and 1.5 m wide; it was exposed by a trench approximately 6 m long. It was discovered in 1945 by Mr. E. Aubert-de-la-Rue of the Quebec Department of Mines. The deposit is on the property of Mr. Ludger Fontaine.

Road log from Highway 105 at km 99.9 (see page 45):

km		
	0.0	Turn right onto road to Pointe-Comfort, Lac Bitobi.
	1.75	Fork bear right.
	1.85	Junction (on east side of bridge); turn right.
	2.0	Sphalerite occurrence on right side of road.

Refs.; 4 pp. 21-22

Maps (T): 31 J/4 Bouchette
(G): 921 Trente-et-un-Milles Lake area, Gatineau, Labelle, and Papineau counties (min. de l'Energie et des Ressources)

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km	**105.4**	**Road-cut on left exposes red garnet aggregates in biotite gneiss.**
	107.5	**Road-cut on left exposes serpentine (yellow, green, grey) in crystalline limestone, and titanite (1 cm crystals) with pyroxene in a white pegmatitic rock.**

108.3 Road-cut on left exposes crystalline limestone containing green serpentine, pyroxene, yellow tourmaline, grey spinel, dark grey calcite, and pyrite. Titanite crystals averaging 1 cm long occur with dark green pyroxene in a white pegmatite associated with the marble.

108.9 Road-cut on left opposite the church in Bouchette. Mica, graphite, pyroxene, serpentine, spinel (mauve) and amphibole (light brown) were noted in the crystalline limestone exposed by the road-cut. The church was constructed of this crystalline limestone.

109.2 Bouchette, at school.

110.4 Road-cut on left exposes crystalline limestone containing pyroxene, mica, graphite, and grey scapolite.

114.9 Junction road to Blue Sea Lake.

116.8 Road-cuts expose crystalline limestone and white pegmatite. Graphite, pyrite, apatite (blue) and pyroxene occur in the marble, and graphite, titanite (crystals 2 cm long), pyrite, and pyroxene were noted in the pegmatite.

119.8 Junction road to Farley.

Zinc Mine

SPHALERITE, PYRRHOTITE, PYRITE, ROZENITE, MICA, PYROXENE

In pyroxenite

Dark brown massive sphalerite is associated with pyrrhotite and minor amounts of pyrite in pyroxenite that is enclosed in crystalline limestone and granite gneiss. The pyrrhotite occurs as dark brown metallic platy aggregates and in massive form. Rozenite forms white botryoidal encrustations on the rusty weathered sulphides on the dumps. Pyroxene, partly altered to serpentine, occurs with phlogopite in crystalline limestone.

This zinc deposit has been known since 1899. It was opened by a shaft and several small excavations some 70 years ago, and in 1927 further trenching and diamond drilling was done. The openings are now overgrown and the dump material is rusty due to weathering.

Road log from Highway 105 at **km 119.8**:

km 0.0 At junction road to Farley, turn right onto gravel road.

0.15 Junction; turn right.

2.65 Junction single-lane road on right. Proceed along road to a gate then along base of cliff to mine. This is about 275 m from the gravel road.

Refs.: 3 pp. 26-27; 90 p. 136

Maps (T): 31 J/5 Maniwaki
(G): 919 Kensington area, West Sheet, Gatineau and Labelle counties (min. de l'Energie et des Ressources)

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km 120.5 Road-cuts on both sides of highway expose crystalline limestone containing disseminations of graphite, mica, pyroxene, pyrite, titanite and scapolite.

123.6 to 126.3 Road-cuts. Crystalline limestone associated with a white pegmatite is exposed by this series of road-cuts. The crystalline limestone contains dark brown tourmaline, pyroxene, pink calcite, mica, apatite (uncommon), titanite, grey scapolite, graphite (at km 125.0) and pyrite. Titanite, pyroxene, purple fluorite (at km 123.8), and tourmaline were noted in the pegmatite.

126.7 Road-cut on right. A rusty weathered pyroxenite occurs with crystalline limestone and pegmatite. Pyrite is common in these rocks. Encrustations of secondary minerals on the weathered rocks include; gypsum, as white to yellowish fibrous aggregates; rozenite, as a white powder; jarosite, as a dull yellow powder; and alunogen, as pale yellow waxy botryoidal aggregates associated with gypsum. Patches of titanite, 2 cm across, occur in the pegmatite.

127.6, 130.5 Road-cuts expose crystalline limestone contalning mica, graphite, apatite (rare), pyroxene, tremolite, grey scapolite and titanite.

131.0 Maniwaki, at junction rue Principale (Highway 105) and rue Commerciale (Highway 107).

Kensington (Acme) Mine

MOLYBDENITE, FELDSPAR, MICA, PYROXENE, TOURMALINE, SCAPOLITE, GARNET, APATITE, MAGNETITE, HEMATITE, PYRITE

In pegmatite dyke cutting biotite syenite and hornblende schist

Molybdenite occurs as coarse flakes and flaky aggregates in orthoclase feldspar at this former molybdenum mine. Flakes measuring as much as 25 cm across were recovered during mining operations but specimens of this size are no longer available from the pit or from the dumps. Feldspar containing vugs lined with microcline crystals (up to 15 cm long), and coarse biotite mica are the principal constituents of the pegmatite. Accessory minerals include light green pyroxene, black tourmaline, yellow scapolite (granular), pink garnet (uncommon), light green apatite (massive and small crystals), magnetite, hematite and pyrite.

The deposit was discovered by Mr. Pierre Morin about 50 years ago. It was originally opened in 1939 and has since been operated at short intervals by various companies including Moldor Exploration Syndicate, Acme Molybdenite Mining Company and Kensington Moly Mining Company Limited. The pit, on the side of a hill, measures approximately 42.5 m by 7.6 m. Specimens are available from the walls of the pit and from adjacent dumps.

Road log from Highway 105 at Maniwaki (**km 131.0**):

km

0.0 At intersection Principale and Commerciale streets, turn right (east) onto rue Commerciale (Highway 107).

3.0 Road-cut, on left, exposes titanite, mica, and pyroxene in crystalline limestone.

3.2 Road-cut, on left, exposes graphite-bearing biotite gneiss coated with powdery yellow jarosite. A quartzite associated with the gneiss also contains graphite flakes.

4.3 Road-cut, on right, exposes crystalline limestone, with disseminations of graphite, mica, titanite, pyrite and pyroxene. Some of these minerals are also present in white pegmatite associated with the limestone.

5.6 Junction; turn left onto road to Ste-Famille d'Aumond.

6.4 Junction road to Kensington; turn right.

11.3 Mine on right. The pit is approximately 70 m above the road.

Refs.: 3 p. 28; 85 pp. 208-211

Maps (T): 31 J/5 Maniwaki

(G): 919 Kensington area, West Sheet, Gatineau and Labelle counties (min. de l'Energie et des Ressources)

Garnet Occurrence

GARNET, SILLIMANITE, EPIDOTE, TOURMALINE, MICA

In biotite gneiss

Pink garnet occurs as aggregates (up to 1 cm across) with sillimanite in gneiss that is exposed by a road-cut on Highway 107. Epidote and quartz occur as bands with greyish green chlorite associated with a white pegmatitic rock that contains some black tourmaline and muscovite.

The road-cut is on the west side of Highway 107 at a point 6.7 km north of its junction with the road to Kensington.

Maps (T): 31 J/5 Maniwaki
(G): 919 Kensington area, West Sheet, Gatineau and Labelle counties (min. de l'Energie et des Ressources)

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km 131.8 Maniwaki, at junction road to Montcerf.

Maniwaki Molybdenite Mine

MOLYBDENITE, PYRITE, PYRRHOTITE, ROZENITE, PYROXENE, SCAPOLITE, AMPHIBOLE, TITANITE, TOURMALINE, APATITE, MICA, MAGNETITE, CALCITE

In pyroxenite at contact crystalline limestone and biotite gneiss

Molybdenite occurs as sparsely disseminated small flakes in rusty weathered pyroxenite. Specimens of molybdenite are now uncommon at the mine. Pyrite and pyrrhotite are associated with the ore zone. Rozenite, a secondary mineral, occurs as a white globular encrustation on the rusty weathered rock. Minerals noted in the crystalline limestone include: pyroxene, scapolite (pale mauve, colourless, and light green), titanite, black tourmaline, apatite, mica, pink calcite, and magnetite. They generally occur as granular aggregates.

The deposit was discovered by Mr. J. Callahan and was first worked in 1917-1918 by the Standard Molybdenite Company which shipped about 27 t of ore to the Mines Branch, Ottawa. Some prospecting was done on the property between 1935 and 1940. The excavations were conducted in two zones, 305 m apart and connected by a trail. The eastern zone (first one reached along the trail) has a 91 m trench which deepens to a pit at each end; the western zone consists of a series of small pits and trenches.

Road log from Maniwaki at junction Montcerf Road:

km 0.0 Turn left (west) onto road to Montcerf.

0.95 Junction; turn left.

4.7 Junction single-lane tractor road on left. Proceed along this road to fork at the bottom of the hill; bear right to another fork and bear right again. This fork leads to the eastern zone. (The total distance from the Montcerf Road is about 640 m.) The trail continues 300 m to the western zone.

Refs.: 22 pp. 134-137; 85 pp. 202-207; 90 pp. 131-132

Maps (T): 31 K/8 Lac Pythonga
(G): 1795 Portions of Maniwaki, Kensington, Egan and Aumond townships, Hull County, Quebec (GSC)

Baskatong Quartz Mine

A large mass of snow-white quartz that forms a prominent hill on the shore of Baskatong Lake has been quarried by Baskatong Quartz Products since 1962. The hill about 40 m high is known locally as "La Montagne Blanche". The quartz is massive and varies from a very fine grained compact to a sugary texture. Small cavities in it are filled with kaolinite; some large cavities (a few cm across) are lined with colourless quartz crystals averaging 5 mm in diameter.

The quartz is used for the manufacture of silicon metal, as grinding pebble, and as exposed aggregate in decorative concrete. A crushing plant has bee installed at the quarry site.

Road log from Maniwaki at **km 131.8** (see page 50):

km	
0.0	Junction Highway 105 and the Montcerf road; proceed north along Highway 105.
0.95, 1.45	Road-cuts expose crystalline limestone containing grains of titanite, pyroxene, mica, apatite (uncommon), and scapolite.
2.6 to 4.8	Road-cuts expose coarse crystalline limestone containing orange chondrodite, amber mica, grey to blue spinel, light green amphibole, green pyroxene, serpentine, hydrotalcite, apatite, magnetite, graphite and pyrite. Tochilinite occurs as irregular black patches and streaks and as coatings on hydrotalcite.
5.3	Road-cut on right exposes small bladed actinolite aggregates in pale pink cacite and in crystalline limestone.
5.5	Road-cut on left exposes crystalline limestone containing tourmaline (light brown), mica, graphite, pyrite, titanite, apatite, pyroxene and tremolite.
6.6	Road-cut on right exposes serpentine, mica, pyroxene, pyrite, and tremolite in crystalline limestone; some mauve scapolite occurs with pyroxene in white aplite associated with the marble.
7.1	Road-cuts both sides highway, expose purplish red garnet (aggregates averaging 5 mm in diameter) in a biotite schist and with biotite in pegmatite.
16.1	Junction road to Montcerf.
20.6	Road-cut on left exposes crystalline limestone containing grains of amber mica, blue apatite, light brown titanite and orange chondrodite.
27.2	Road-cut on left exposes garnetiferous biotite gneiss and some crystalline limestone. White radiating stilbite associated with massive pyrite and with granular pyroxene and epidote occurs along fractures in the gneiss. Actinolite, mica, apatite (rare), pyrite, molybdenite and titanite occur in salmon-pink calcite.
29.3	Grand-Remous, at junction Highway 117; proceed east along Highway 117.
31.0	Junction gravel road to Philomene Bay; turn left.
31.7	Junction; turn right.
33.6	Fork; bear left.
46.9	Junction; turn right.
50.6	Baskatong quartz mine.

Refs.: 2 pp. 53-55; 17 p. 410

Maps (T): 31 J/12 Grand-Remous
(G): 545 Sicotte area, Labelle and Gatineau counties (min. de l'Energie et des Ressources)

Mercier Dam Quarry

SCAPOLITE, DIOPSIDE, AMPHIBOLE, TITANITE, SPINEL, GRAPHITE, MICA, AMETHYST

In crystalline limestone

The most conspicuous minerals in the quarry are: scapolite, as honey-yellow prisms measuring 1 to 2 cm in diameter in pink calcite; diopside, as pale yellow and green crystals averaging 5 mm across; amphibole, as grey to brown aggregates; titanite, as dark brown crystals (up to 1 cm across) in pyroxene. Less common are purplish blue spinel (irregular grains), graphite, and green and light amber mica. Amethyst crystals associated with massive quartz have been reported from the deposit.

The floor of the quarry is overgrown but specimens can readily be collected from the quarry walls and from broken blocks of rock along the floor. The quarry was opened in 1927 to supply stone for the construction of the Mercier dam which created the Baskatong Reservoir out of the existing Baskatong Lake. At that time, this became the world's third largest artificial reservoir.

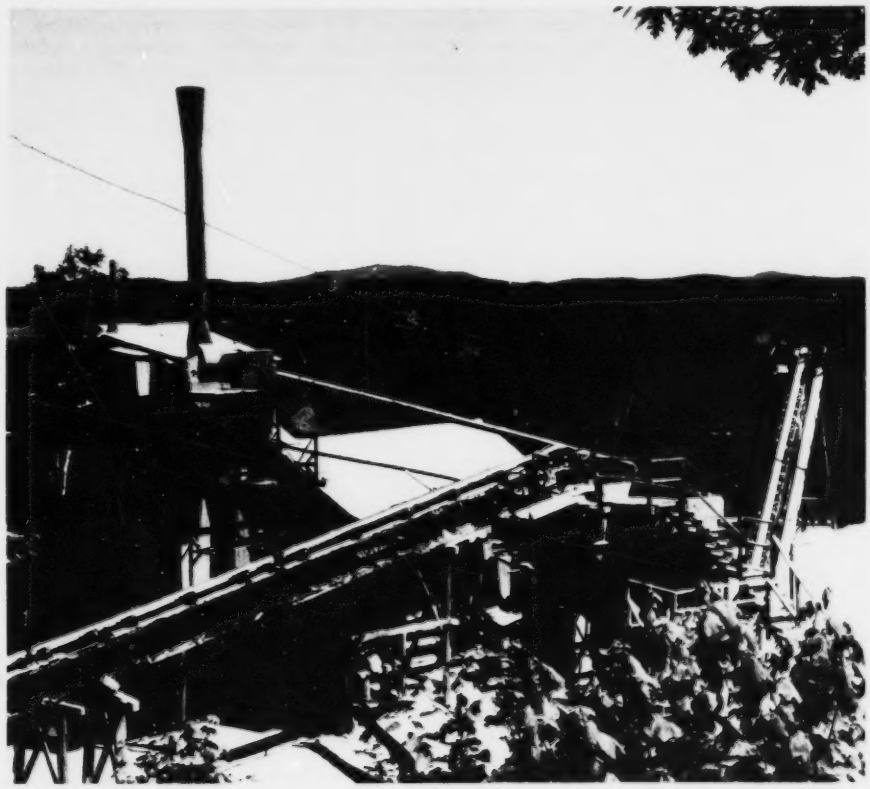

Plate IX

Baskatong quartz mine on shore of Baskatong Lake. (GSC photo 151271)

Road log from Grand-Remous at junction Highways 105 and 117:

km

0.0 Proceed west along Highway 117.

4.8 Junction road to Chute du Chat.

5.8 Road-cut on right exposes crystalline limestone cut by pink calcite veins containing pyroxene, mica, serpentine, and tourmaline. Magnetite occurs in a white pegmatite body in the limestone.

6.7 Road-cuts expose grey pegmatitic rocks enclosing brown titanite crystals (up to 3 cm long), and crystalline limestone containing pyroxene, serpentine and mica.

8.4 Road-cut on left exposes crystalline limestone containing scapolite (light green to grey), graphite, pyroxene, serpentine and pyrite. Pink granite is exposed by the cut on the north side of the highway.

8.8 Road-cut on left exposes crystalline limestone containing disseminations of pyroxene, titanite, mica, apatite, serpentine, scapolite, and tourmaline.

11.6 Road-cut opposite junction Montcerf Road exposes crystalline limestone enclosing brown titanite, green diopside, blue apatite, mica, graphite, light grey and brown amphibole (prismatic aggregates), and rutile (small crystals).

13.0 Road-cuts expose crystalline limestone containing pink calcite, light green tremolite, mica, green diopside, and grey scapolite. A white pegmatite in the same road-cuts contains crystals of titanite with pyroxene and hornblende.

15.1 Junction gravel road (this is 3.2 km from the gate to La Verendrye Park); turn right.

20.4 Fork at Mercier dam; turn right.

20.6 Mercier dam quarry on right.

Ref.: 2 pp. 13, 21, 57

Maps (T): 31 J/12 Grand-Remous
(G): 545 Sicotte area, Labelle and Gatineau counties (min. de l'Energie et des Ressources).

SECTION 2

OTTAWA – PETERBOROUGH

km		
	0.0	**Ottawa, at junction Highway 7/15 (Richmond Road) and Highway 17 (Carling Avenue). The road log follows Highway 7 to Peterborough; proceed west along Richmond Road.**
	5.5	**Bells Corners, at intersection Moodie Drive.**

McFarland Quarry

CALCITE, STRONTIANITE, MARCASITE, FOSSILS

In limestone

Black River limestone of Ordovician age is quarried on this property by H.J. McFarland Construction Company Limited. Occurring in it are small amounts of pink and white crystalline calcite associated with white fibrous strontianite. Marcasite is found in the calcite. Shell fossils occur in the rock which is used in road construction.

The quarry and crushing plant are on the west side of Moodie Drive at a point 5.3 km south of its junction with Highway 7.

Ref.: 37 p. 38

Maps (T): 31 G/5 Ottawa
(G): 414A Ottawa Sheet (west half) Carleton and Hull counties, Ontario and Quebec (GSC)

1508A Ottawa – Hull, Ontario and Quebec (G.S.C., 1:125 000)

km		
	11.1	**Hazeldean, at junction Young Road.**

South March Quarry

FELDSPAR, QUARTZ, MICA, TOURMALINE, CHLORITE, HEMATITE, PYRITE, MAGNETITE, URANINITE, CALCITE, FLUORITE, GRAPHIC GRANITE

In pegmatite

Pink to orange-red microcline feldspar was formerly quarried here. Much of it has a rusty appearance due to iron stains derived from the hematite and magnetite. Feldspar, white to colourless quartz and black mica are the chief constituents of the pegmatite. The most common accessory minerals are black tourmaline, dark green chlorite, and hematite; less abundant are pyrite and magnetite. Uraninite, as black nodules measuring up to 1 cm in diameter, and a little calcite and fluorite have been reported from the deposit. Pink graphic granite is also present.

The deposit has been known for about 85 years. The quarry was operated from 1919 to 1921 by O'Brien and Fowler of Ottawa. About 3175 t of feldspar for use as stucco material was produced from a pit measuring 40 by 9 m and 9 m deep.

Road log from Highway 7 at km 11.1:

km	
0.0	Turn right (north) onto Young Road.
0.9	Junction; turn left.
1.0	Junction; turn right.
4.3	Junction paved road; turn right.
4.35	Entrance to quarry on left.

Refs.: 23 p. 238; 80 p. 36

Maps (T): 31 G/5 Ottawa
(G): 414A Ottawa Sheet (west half) Carleton and Hull counties, Ontario and Quebec (GSC)

1508A Ottawa – Hull, Ontario and Quebec (G.S.C., 1:125 000)

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km **20.1** Junction road to Huntley.

25.6 Road-cuts expose light grey Black River limestone containing a few crinoids and shell fossils. White massive calcite and crystals (dogtooth spar) are also present. An old quarry in a pasture just north of the road-cut exposes similar rock.

38.0 Junction Highway 15/29.

41.8 Junction Town Line West.

Cameron Quarry

CALCITE, DOLOMITE, SPINEL, CHONDRODITE, TREMOLITE, SERPENTINE, TOURMALINE, PYROXENE, SCAPOLITE, MICA, APATITE, TITANITE, ZIRCON, FLUORITE, SPHALERITE, GRAPHITE, PYRITE

In crystalline limestone

Compact grey and white banded crystalline limestone contains a variety of minerals. Coarsely crystalilne cream-white to pink calcite is common and, in places, the calcite has a fibrous structure. Dolomite is common as colourless, grey and light yellow grains. Spinel occurs as mauve crystals measuring up to 12 mm in diameter and as black crystal aggregates. Chondrodite, as yellow, orange and brownish orange granular aggregates, is conspicuous and occurs as bands in the limestone. Other minerals occurring in the deposit include: colourless, yellow, light green and grey tremolite; green, blue-green to black serpentine; reddish brown tourmaline; grey and green pyroxene; colourless, green to grey scapolite; silvery and amber mica; colourless to blue apatite; brown titanite; pink fluorite; pink zircon; and disseminated grains of sphalerite, graphite and pyrite.

The quarry was operated about 45 years ago by Mr. W.D. Cameron of Carleton Place where the lime kiln was located. Quarry openings were made into the side of a low wooded ridge. The property belongs to Carleton Lime Products, c/o Mr. Stewart Nielson of Carleton Place.

Road log from Highway 7 at **km 41.8**:

km 0.0 Turn right onto Town Line West.

1.9 Intersection; turn left onto Thomas Street.

2.4 Junction; proceed left onto Bridge Street.

5.5 Junction; continue straight ahead.

7.7 Junction; turn right.

8.2 Gate to quarry on left.

Refs.: 26 pp. 113-114; 37 p. 17

Maps (T): 31 F/1 Carleton Place
(G): 7-1964 Carleton Place (GSC)

1508A Ottawa – Hull, Ontario and Quebec (G.S.C., 1:125 000)

Ramsay Mine

GALENA, CERUSSITE, CALCITE, PYRITE, CHALCOPYRITE, SPHALERITE

In veins cutting dolomitic limestone

Galena occurs in cream-white to pinkish calcite and grey dolomitic limestone at this former lead mine. Cerussite occurs as a powdery coating on the galena. Pyrite, chalcopyrite and sphalerite are present in small amounts. The calcite fluoresces bright pink when exposed to 'short' ultraviolet rays.

The deposit was worked in 1858 and in 1925 from two shallow shafts. A smelting furnace was erected on the site when the mine was first operated. The openings and small dumps are now moss-covered and overgrown with cedars.

Road log from Highway 7 at **km 41.8** (see page 55):

km		
	0.0	Turn right onto Town Line West.
	1.9	Intersection; turn left onto Thomas Street.
	2.4	Junction; continue straight ahead along Ramsay Conc. 7 Road.
	3.4	Turn right into pasture and old rifle range. After passing through gate, turn left and proceed 45 m to a trail on right. Follow trail for about 45 m to the mine in the cedar clump.

Refs.: 1 pp. 140-141; 53 pp. 688-689

Maps (T): 31 F/1 E Carleton Place
(G): 7-1964 Carleton Place (GSC)
1508A Ottawa – Hul, Ontario and Quebec (G.S.C., 1:125 000)

Beckwith Construction Quarry

CALCITE, FOSSILS

In dolomitic limestone

Small crystals of white and pink calcite line cavities in the limestone which is sparsely fossiliferous. The rock is Beekmantown dolomite of Ordovician age.

The quarry was opened in 1963 by the Beckwith Construction Company.

Road log from Highway 7 at **km 41.8** (see page 55):

km		
	0.0	Turn right onto Town Line West leading to Highway 29.
	5.3	Turn-off (left) to quarry.
	5.5	Quarry.

Ref.: 37 p. 18

Maps (T): 31 F/1 Carleton Place
(G): 7-1964 Carleton Place (GSC)
1508A Ottawa – Hul, Ontario and Quebec (G.S.C., 1:125 000)

km	**42.3**	**Road-cut on left exposes limestone containing veins of coarsely crystalline calcite that fluoresces bright pink when exposed to 'short' ultraviolet rays.**
	50.7	**Junction road to Lanark.**

71.3 Perth, at junction Highway 43. Occurrences between Perth and Kingston are described in Geological Survey of Canada. Miscellaneous Report 32

71.9 Perth, at junction road to Lanark (Highway 511)

Perth Quarry

FELDSPAR, QUARTZ, TOURMALINE, MICA, PYROXENE, HEMATITE, PYRITE, PERISTERITE

In pegmatite

Pink feldspar was formerly quarried here. Associated with it are white quartz, black tourmaline (massive), mica, dark green pyroxene and small amounts of hematite and pyrite. Pink peristerite with blue iridescence is present but it is not common.

The quarry was operated between 1922 and 1926; approximately 4170 t of feldspar were shipped. The pit measures 21 by 21 m and 6 m deep; it is now water-filled. Large blocks of the pegmatite lie adjacent to the pit. The property belongs to Mr. Carl Duncan. A feldspar quarry in which graphic granite occurs is located on the opposite side of the road just north of this quarry.

Road log from Highway 7 at Perth (km 71.9):

km		
	0.0	Proceed north along road to Lanark.
	6.9	Balderson crossroads; turn left onto Road No. 7.
	9.5	Junction; turn right.
	10.8	Junction; turn left onto gravel road.
	11.3	Carl Duncan farmhouse on left. Arrange for visit to Perth quarry here.
	11.6	Lloyd Foster farmhouse on right and Keays quarry (see below).
	11.9	Junction at schoolhouse; turn right.
	12.5	Perth quarry on right.
	12.95	Turn-off (left) to feldspar quarry for graphic granite. A trail, 275 m long leads west from this point to the quarry.

Refs.: 32 p. 11; 80 pp. 42, 43

Maps (T): 31 C/16 Perth
(G): 1089A Perth, Lanark and Leeds counties (GSC)

Keays Quarry

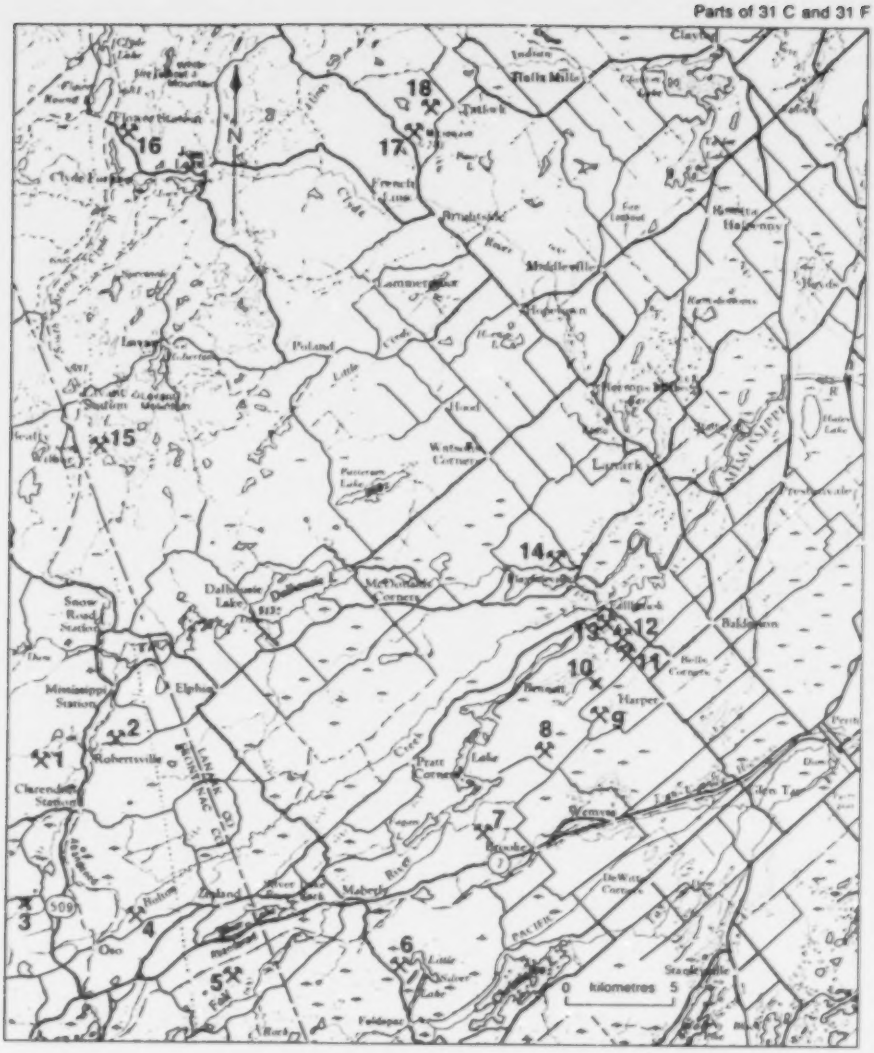
FELDSPAR, QUARTZ, MICA, PERISTERITE, TOURMALINE, MAGNETITE, EPIDOTE, BASTNAESITE

In pegmatite

Pink feldspar, white quartz and mica are the chief constituents of the pegmatite. Pink peristerite is common. It has a blue schiller and could be fashioned into attractive ornamental objects such as book-ends, paperweights, etc. Patches of black tourmaline, light green epidote, bastnaesite and some magnetite occur in the pegmatite.

The deposit was one of the first major feldspar properties to be worked in this area. A total of 18 903 t of feldspar were produced from 1921 to 1927. The mine was the principal feldspar producer of the Perth area during this period. The operator was Rock Products Limited of Ohio. The pit, now water-filled, measures 38 m by 15 m and is 37 m deep. Specimens are available from the dumps surrounding the pit.

Parts of 31 C and 31 F



Map 6

Perth area

1. Marlhill Mine
2. Robertsville Mine
3. Crawford barite occurrence
4. Angelstone (Sharbot Lake) quarry
5. Silver Lake Mine
6. Orser-Kraft quarry
7. Kirkham Mine
8. Foster quarry
9. Bathurst Mine
10. Graphic granite occurrence
11. Perth quarry
12. Keays quarry
13. Ennis quarry
14. Playfair Mine
15. Wilbur Mine
16. Radenhurst and Caldwell Mine
17. Angelstone (Tatlock) quarry
18. Omega marble quarry

The quarry is located on a low hill in a pasture on the farm of Mr. Lloyd Foster (see road log to Perth quarry, page 57).

Refs.: 32 p. 11; 80 p. 43

Maps (T): 31 C/16 Perth
(G): 1089A Perth, Lanark and Leeds counties (GSC)

Graphic Granite Occurrence

A small road-side pit exposes graphic granite associated with pink feldspar. The granite is pink and its quartz-feldspar intergrowths are very fine.

Road log from Highway 7 at Perth (**km 71.9**, see page 57):

km 0.0 Proceed north along road to Lanark and follow log toward Perth mine.

11.9 Junction at schoolhouse; continue straight ahead.

14.0 Pit on right about 45 m from the road.

Maps (T): 31 C/16 Perth
(G): 1089A Perth, Leeds and Lanark counties (GSC)

Ennis Quarry

FELDSPAR, QUARTZ, MICA, TOURMALINE, EUXENITE

In pegmatite

The feldspar at this quarry is similar to that found at the Perth and Keays quarries. White quarry and mica are the other components of the pegmatite. Black tourmaline and amber to black euxenite (crystals up to 12 cm long) occur in the feldspar.

The pit was opened as a prospect in 1922. It measures 9 m by 6 m and is 5.5 m deep. There are two smaller pits nearby.

Road log from Highway 7 at Perth (**km 71.9**, see page 57):

km 0.0 Turn right onto road to Lanark.

6.9 Balderson crossroads; turn left and follow Road No. 7.

10.8 Junction (road on left leads toward Perth and Keays quarries); continue along road No. 7.

11.7 Turn-off (left) to the Charles Ennis farm.

11.9 Farmhouse. Obtain permission to visit quarry, located 180 m west of the house.

Refs.: 32 p. 11; 67 pp. 20-21

Maps (T): 31 C/16 Perth
(G): 1089A Perth, Lanark and Leeds counties (GSC)

Playfair (Dalhousie) Mine

HEMATITE, PYRITE, TREMOLITE, MICA, SERPENTINE, TALC, EPIDOTE, CHLORITE, GOETHITE

In dolomitic limestone

High-grade red massive hematite was formerly mined from this deposit. Associated with it are pyrite and abundant tremolite; the latter occurs as light green, colourless, white and pale yellow, bladed and fibrous aggregates. Other minerals found less commonly in the crystalline limestone are mica (colourless, amber and light green), serpentine, talc, epidote, chorite and goethite.

The mine was worked between 1866 and 1873 from a 28.6 m open inclined shaft on the north side of the road, and from a 183 m trench that is bridged by the road. The trench is now overgrown. There is a small dump approximately 64 m northeast of the shaft.

Road log from Highway 7 at Perth (**km 71.9**, see page 57):

km		
	0.0	Turn right onto road to Lanark.
	6.9	Balderson crossroads; turn left and follow Road No. 7 toward Fallbrook.
	13.0	Road-cuts on both sides of road expose crystalline limestone containing amber tourmaline, pale orange chondrodite, graphite, pyrite, marcasite, hematite, mica, colourless tremolite and olive green serpentine. The tremolite fluoresces bright yellow when exposed to 'short' ultraviolet rays. Scalenohedrons of calcite encrusted with marcasite occur in the marble.
	15.4	Junction; turn right.
	16.0	Road-cut on left exposes crystalline limestone containing abundant grey and colourless tremolite with small amounts of mica, graphite, pyrite and magnetite. Slender crystals of tremolite measuring 5 cm long were noted. Under 'short' ultraviolet rays the tremolite fluoresces pale yellow.
	16.1	Junction; turn left onto gravel road.
	16.4	Junction; turn left.
	18.2	Road bridges the trench at this point. On right is the trail to the shaft.

Refs.: 52 pp. 138-139; 66 pp. 62-63, 64; 76 p. 7

Maps (T): 31 C/16 Perth
(G): 1089A Perth, Lanark and Leeds counties (GSC)
1956-4 Clarendon-Dalhousie-Darling area (O.G.S.)

Radenhurst and Caldwell Mine

MAGNETITE, PYRITE, HORNBLENDE, PYROXENE, MICA, JAROSITE

In gneiss and schist

Fine-grained magnetite is the ore mineral at this former iron mine. Massive pyrite is associated with it. Less conspicuous in the deposit are hornblende, pyroxene and mica. Jarosite occurs as a rusty or yellow coating on the magnetite.

The deposit was worked by a series of small pits and a shaft over an area of 915 m. It was mined prior to 1899 and was explored by Frobisher Exploration Company Limited in 1941-42. The pits are now overgrown but specimens may be collected from the dumps. The mine is on the Crosbie farm.

Road log from Highway 7 at Perth (km 71.9, see page 57):

km		
	0.0	Proceed along road to Lanark.
	14.0	Lanark, at junction road to Carleton Place; continue straight ahead.

27.0 Junction road to Lavant, Poland; continue straight ahead.

28.8 Road-cuts expose white and grey banded crystalline limestone
29.3 containing light green tremolite aggregates and dull green serpentine. Pale orange chondrodite occurs as bands in the limestone. Graphite, pyrite and mica were also noted in this rock.

29.6 Road-cuts expose fine-grained diorite cut by veins (about 1 cm wide) of epidote associated with pink feldspar, pyrite and abundant calcite. Colourless and slightly amethystine quartz crystals (about 5 mm in diameter) line cavities in the calcite.

31.0 Junction; turn left onto gravel road to Flower Station.

44.4 Junction at Joe Lake; turn right.

47.6 Junction at Clyde Forks; turn right.

50.5 Flower Station and junction single-lane road on right in front of bridge; turn right.

51.0 Fork; bear right.

51.5 Trail on right at entrance to sand pits. Walk beyond the pits, then turn left and proceed through the pasture for about 90 m to the mine in a wooded area. An old shaft is located here. To reach other shaft, continue along gravel road.

51.6 Fork; bear right.

52.1 Junction single-lane road on right; bear left.

52.2 The second shaft and dumps are located on the left about 45 m from the road.

52.4 Pits on right about 65 m from the road. Permission to visit this mine should be obtained from Mr. Crosbie at the grocery store in Flower Station.

Refs.: 47 pp. 52-54; 65 p. 59; 66 pp. 47-49

Maps (T): 31 F/2 Clyde
(G): 1956-4 Clarendon-Dalhousie-Darling area (O.G.S.)

Angelstone Tatlock Quarry

MARBLE

Pure white marble contains small amounts of light green and colourless tremolite, white granular diopside and rare grains of titanite and pyrite. The marble, known as "Temple White" is used for interior decoration.

The quarry was opened in 1962 by Angelstone Limited.

Road log from Highway 7 at Perth (km **71.9**, see page 57):

km 0.0 Proceed along road to Lanark.

14.0 Lanark, at junction to Carleton Place; continue straight ahead.

33.6 Junction; turn right onto road to Tatlock.

35.2 Angelstone Limited quarry on left.

Ref.: 37 p. 16

Maps (T): 31 F/1 Carleton Place
(G): 1956-4 Clarendon-Dalhousie-Darling area (O.G.S.)

Omega Marble Tile and Terrazzo Quarry

MARBLE

An attractive sky blue, white and light grey marble is quarried near the Tatlock road. Light green tremolite and dark green pyroxene occur in the rock. Pink, green, white and light brown marble occurs in a second quarry located northwest of the first quarry.

The deposit has been operated by Omega Marble Tile and Terrazzo Limited since 1962. The rock is cut into blocks weighing 10 to 15 t and is used as a building stone.

Road log from Highway 7 at Perth (km 71.9, see page 57):

km		
	0.0	Proceed along road to Lanark and follow preceding log.
	33.6	Junction; turn right onto road to Tatlock.
	35.2	Angelstone Limited quarry on left; continue straight ahead.
	36.4	Turn left onto mine road.
	36.6	Quarry

Refs.: 37 p. 16; 38 pp. 64-68

Maps (T): 31 F/1 Carleton Place
(G): 1956-4 Clarendon-Dalhousie-Darling area (O.G.S.)

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km 71.9 Perth, at junction road to Lanark.

76.1 Junction; road on right leads to Bathurst and Foster quarries, road on left to the Christie Lake Tourist area.

Bathurst Quarry

FELDSPAR, QUARTZ, MICA, TOURMALINE, PYRITE, HEMATITE, KAOLINITE

In pegmatite

The feldspar is pink and, less commonly, red and greenish. Associated with it are light green muscovite, colourless and white quartz, and biotite. Black tourmaline occurs in the feldspar as radiating and stellate aggregates. Pyrite, red earthy hematite, and powdery white kaolinite (in cavities) are also found in the feldspar.

The mine was worked by Bathurst Feldspar Mines Limited from 1926 until 1951. Approximately 90 700 t of feldspar were produced making this the largest feldspar producer in the Perth area, and the second largest in the province, after the Richardson Mine in the Verona district. The pit measures 61 m by 18 m and is 18 m deep.

Road log from Highway 7 at km 76.1:

km		
	0.0	Turn right onto gravel road to Harper.
	5.3	Crossroad; turn left.
	9.9	Junction; turn right.
	10.8	Junction; turn right onto single-lane mine road.
	11.2	Bathurst quarry.

Refs.: 32 p. 11; 80 pp. 41-42

Maps (T): 31 C/16 Perth
(G): 1089A Perth, Lanark and Leeds counties (GSC)

Foster Quarry

FELDSPAR, QUARTZ, BIOTITE, TOURMALINE, PYRITE, PYROXENE, TITANITE, MAGNETITE, KAOLINITE

In pegmatite

This deposit is similar to that at the Bathurst Quarry except that the feldspar is generally of a deeper red colour. Quartz, biotite, tourmaline and pyrite are the most common minerals associated with the feldspar. Attractive specimens of feldspar containing star-shaped aggregates of black tourmaline are readily found in the dumps. Minerals that are relatively rare include dark green pyroxene, brown titanite, magnetite, and kaolinite.

The quarry was operated in 1929 by Feldspar Quarries Limited.

Road log from Highway 7 at **km 76.1** (see page 62):

km		
	0.0	Turn right onto road to Harper.
	5.3	Crossroad; turn left.
	10.0	Junction; turn left.
	11.1	Turn right to quarry.

Ref.: 32 p. 11

Maps (T): 31 C/16 Perth
(G): 1089A Perth, Lanark and Leeds counties (GSC)

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km 87.3, 87.8 Road-cuts expose crystalline limestone containing light green serpentine, graphite, mica and pyrite.

89.0 Junction gravel road on right.

Kirkham Mine

FELDSPAR, QUARTZ, MICA, TOURMALINE, PYRITE, HEMATITE, MOLYBDENITE, CHLORITE, GARNET, SCAPOLITE, SERPENTINE, CALCITE

In pegmatite

The feldspar at this quarry is deep red. Quartz, mica and tourmaline are the most abundant minerals associated with it. The tourmaline is black and occurs as crystal aggregates and as acicular crystals forming attractive stellate patterns on feldspar. Pyrite and hematite are quite common. Minerals that are less abundant are molybdenite, chlorite, garnet, scapolite (light green), and serpentine. Calcite, found on the dump, fluoresces bright pink when exposed to ultraviolet rays ('short' rays more effective than 'long').

The mine produced a small amount of feldspar from 1919 to 1920. The pit, now water-filled, measures 45 m by 23 m. Large dumps lie adjacent to the pit which is on the F. Kirkham farm.

Road log from Highway 7 at **km 89.0**:

km		
	0.0	Turn right onto gravel road.
	0.95	Turn left onto farm road.
	1.1	Kirkham farmhouse. The quarry is just northwest of the house.

Refs.: 32 p. 11; 80 p. 41

Maps (T): 31 C/16 Perth
(G): 1089A Perth, Lanark and Leeds counties (G.S.C.)

km	**89.1, 89.5**	**Road-cuts on left expose crystalline limestone containing graphite, mica, chondrodite, and pyroxene in crystalline limestone. Titanite and pyroxene occur in white pegmatite associated with the limestone.**
	90.1	**Road-cuts, both sides of Highway, expose crystalline limestone containing massive apatite.**
	91.4	**Road-cut on right exposes coarsely crystalline limestone containing serpentine, pyroxene, apatite, graphite, pyrite and magnetite.**
	91.7 to 92.0	**Road-cut on right exposes black tourmaline, light green scapolite and epidote in pegmatite cutting hornblende gneiss. Magnetite occurs in the gneiss.**
	94.4	**Junction Bob's Lake Road.**

Orser-Kraft Quarry

FELDSPAR, MUSCOVITE, TOURMALINE, EUXENITE, GRAPHIC GRANITE

In pegmatite

Pink microcline and grey plagioclase, quartz, and muscovite are the main constituents of the pegmatite. Accessory minerals include black tourmaine and euxenite. Xenotime has also been reported. Pink graphic granite can be found in the dumps.

The deposit was worked for feldspar from 1916 to 1923 by Orser-Kraft Feldspar Limited. The pit, now water-filled, measures 30 m by 11 m.

Road log from Highway 7 at km 94.4:

km	0.0	Turn left onto Bob's Lake Road.
	1.7	Railway crossing.
	4.5	Quarry in field on left about 60 m from road.

Refs.: 23 p. 233; 32 p. 11; 67 p. 26; 80 p. 43

Map (T): 31 C/15 Sharbot Lake

km	**95.4**	**Turn-off (right) to Maberly.**
	95.7	**Road-cuts on both of highway expose black tourmaline and light green scapolite in quartz veins cutting feldspar gneiss. Veinlets of epidote cut the feldspar.**
	98.1	**Turn-off (right) to Silver Lake Camping Site.**
	104.9	**Junction on left to Silver Lake mine.**

Silver Lake Mine

APATITE, HORNBLENDE, SCAPOLITE, PYROXENE, EPIDOTE, TITANITE, MAGNETITE, PYRITE, HEMATITE, MICA

In veins cutting syenite gneiss, diorite and gabbro

Apatite was formerly mined from this deposit. It occurs as purplish red to reddish brown and less commonly light green to colourless granular masses. The reddish hue is due to inclusions of finely disseminated red iron oxide. The most abundant minerals occurring with the apatite are hornblende, scapolite (light green) and pyroxene. Epidote and titanite associated with scapolite and with pink feldspar. Magnetite, pyrite, hematite and mica are also present.

The deposit was worked for only a few months in 1891; approximately 226 t of phosphate were extracted. There are about 20 shallow pits on the property.

Road log from Highway 7 at **km 104.9:**

km	0.0	Turn left onto an old part of the highway.
	0.3	Junction; turn right.
	2.1	Junction single-lane road on left; proceed along this road.
	4.8	Mine on left. A creek crosses the road about 1.2 km from the mine so that it is not possible to drive all the way.

Refs.: 31 pp. 34-35; 39 p. 39; 77 p. 49

Maps (T): 31 C/15 Sharbot Lake
(G): 1947-5 Olden-Bedford area (O.G.S.)

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km	**105.9**	**Junction road to Zealand.**
	107.0	**Junction Highway 38. The occurrences between this junction and Kingston are described in G.S.C. Miscellaneous Report 32.**
	108.3	**Junction Highway 509.**

Highway 509 occurrences

Road log for side trip to occurrences along Highway 509 (underlined occurrences are described in text following log):

km	0.0	Turn right onto Highway 509. Road-cut on left exposes folded white and grey banded crystalline limestone containing mica, tremolite, scapolite (light green), titanite, graphite and pyrite.
	1.8	Junction on right to Angelstone quarry.
	3.5	Junction on left to the Crawford barite occurrence.
	8.2	Road-cut on left exposes light green bladed tremolite in marble.
	9.5	Clarendon, at junction to Ardoch; continue straight ahead.
	11.3 to 11.9	Road-cuts expose veinlets of epidote in amphibolite.
	13.0	Intersection. Road on left leads to the Marlhill Mine, the one on right to the Robertsville Mine.

Angelstone (Sharbot Lake) Quarry

MARBLE

Grey and white banded crystalline limestone (marble) was formerly quarried at this locality. Minor amounts of mica and tremolite were noted in the marble. The marble from eastern quarry was commercially known as "Sharbot Wave".

The marble was mined from two small quarries on the N.A. McPherson farm in 1962-63 by Angelstone Limited.

Road log from Highway 509 at km 1.8 (see above):

km	0.0	Turn right onto gravel road.
	4.8	Junction; turn left.
	5.1	McPherson farmhouse on left. One quarry is located 152 m west of the house; the other is 300 m east of the house.

Ref.: 38 pp. 58-60

Maps (T): 31 C/15 Sharbot Lake
(G): 1947-5 Olden-Bedford area (O.G.S.)

Crawford Barite Occurrence

BARITE, CALCITE, FLUORITE

In crystalline limestone

White, pink and grey banded barite occurs in calcite veins cutting limestone. The veins are up to 1 m wide. Columnar, platy and massive barite were noted. Calcite crystals (scalenohedrons) associated with the deposit fluoresce bright pink under ultraviolet rays ('short' rays more effective than the 'long'). Colourless and green fluorite occurs on the barite.

The deposit is exposed by a trench (measuring 30 m by 1.8 m and up to 6 m deep) on the west side of a ridge. The work was done in 1908 and no further activity has since been reported. The pit is partly overgrown and there is a small pile of ore specimens at is entrance. The occurrence is on the Crawford farm.

Road log from Highway 509 at km 3.5 (see page 65):

km 0.0 Turn eft onto gravel road.

1.8 Crawford farmhouse on left. Obtain permission to visit occurrence.

Ref.: 31 pp. 40-41

Maps (T): 31 C/15 Sharbot Lake
(G): 1947-5 Olden-Bedford area (O.G.S.)

Marlhill Mine

CALCITE

In vein cutting granite gneiss

Cream-white calcite in massive form and as crystal measuring up to 20 cm across was formerly mined at this locality. It fluoresces bright pink when exposed to 'short' ultraviolet rays, and reddish pink under the 'long' rays. Rare impurities include small crystals of hematite and chorite.

The deposit was worked by two quarries; the larger one measures 100 m by 26 m and is 12 m deep. The deposit was opened in about 1920 and operations ceased in 1946. Marlhill Mines Limited operated the deposit for use in the pulp industry in Baie-Comeau.

Road log from Highway 509 at km 13.0 (see page 65):

km 0.0 Turn left onto single-lane road.

1.3 Junction; bear left.

2.7 Quarry; continue along road to other quarry.

Refs.: 26 pp. 73-74; 76 pp. 42-44

Maps (T): 31 C/15 Sharbot Lake
(G): 1956-4 Clarendon-Dalhousie-Darling area (O.G.S.)

Robertsville (Mississippi) Mine

MAGNETITE, AMPHIBOLE, PYROXENE, CALCITE, EPIDOTE, APATITE, TITANITE, CHALCOPYRITE, PYRITE, STRONTIANITE

At contact of crystalline limestone and gneiss

Magnetite, the ore mineral, is mostly granular but also occurs as crystal aggregates. The most abundant associated minerals are hornblende, pyroxene, pink calcite (fluoresces bright pink under ultraviolet rays), and epidote (veins up to 1 cm wide). Less common are apatite, titanite, chalcopyrite, pyrite and strontianite (white fibrous aggregates on calcite).

The deposit was worked by open pits, the largest measuring 15 by 30 m and 60 m deep. The smaller pits are now overgrown. The mine was worked between 1880 and 1895; 27 210 to 36 280 t of ore were shipped to the U.S. Exploratory work was conducted on the property in 1951 by Trent River Iron Limited.

Road log from Highway 509 at km 13.0 (see page 65):

km		
	0.0	Turn right onto gravel road.
	0.9	Junction; bear right.
	1.6	Junction mine road on left. Walk through the pasture for approximately 275 m to the pits near the base of a wooded ridge.

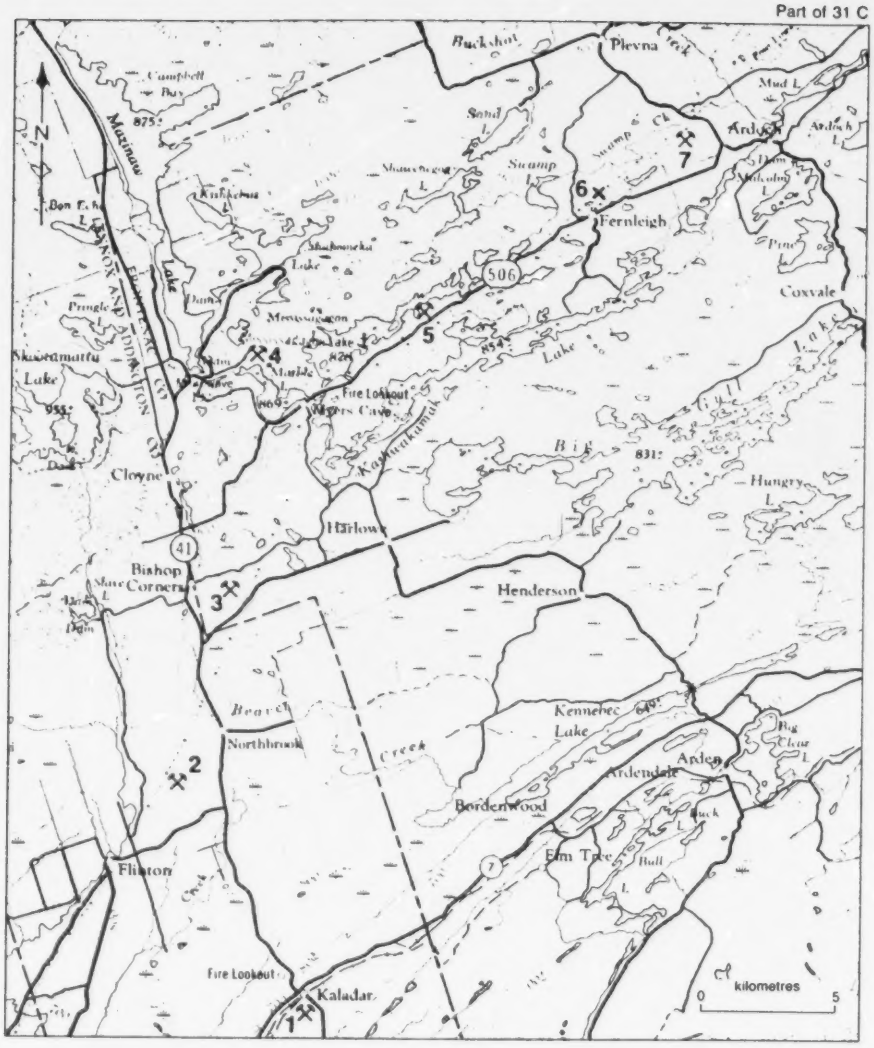
Refs.: 47 pp. 29-32; 66 pp. 51-52; 76 pp. 41-42

Maps (T): 31 C/15 Sharbot Lake
(G): 1956-4 Clarendon-Dalhousie-Darling area (O.G.S.)

This is the last occurrence described for the side trip along Highway 509; the main road log along Highway 7 is resumed.

km		
	108.3	**Junction Highway 509.**
	108.5	**Road-cuts expose banded grey and white crystalline limestone. Mica, graphite, dark green serpentine and tremolite occur in the rock.**
	109.1	**Road-cuts expose red syenite containing platy hematite and tourmaline. Tiny grains of chondrodite (orange), mica and graphite and disseminated in crystalilne limestone at the eastern end of the road-cut.**
	109.9, 110.4	**Road-cuts expose coarse crystal aggregates of black tourmaline with pink feldspar in biotite gneiss. These road-cuts are on either side of the Nelson Road junction.**
	117.9	**Road-cuts expose crystalline limestone in which were noted small patches of purple fluorite and pyrite.**
	118.1	**Junction Munialuk Road.**
	122.9	**Junction Mountain Grove Road.**
	123.2 to 123.6	**Road-cuts. Tremolite is abundant in crystalline limestone exposed by these cuts.**
	129.2	**Road-cut on left exposes banded crystalline limestone; the light green bands contain tremolite, the brown bands, mica. Coarsely crystalline white calcite bands in the rock fluoresce bright pink under 'short' ultraviolet rays.**
	129.7	**Road-cuts. Coarsely crystalline white calcite (fluoresces bright pink under 'short' ultraviolet rays) occurs in crystalline limestone.**

Part of 31 C



Map 7

Kaladar area

1. Kaladar marble quarry
2. Golden Fleece Mine
3. Ore Chimney Mine
4. Star gold mine
5. International Mine
6. Fernleigh kyanite occurrence
7. Boerth Mine

129.8 Junction road to Arden, Harlowe.

137.1 Junction Elmtree Road.

147.4 Road-cut on left exposes light greyish green tremolite marble containing abundant crystals and bladed aggregates of green actinolite.

148.0 Kaladar at junction Highway 41.

Highway 41 occurrences

Road log for occurrences along Highway 41 north of Kaladar (underlined localities are described in the text following the road log):

km

0.0 Proceed north along Highway 41.

7.9 Junction Flinton Road to Golden Fleece Mine.

14.2 Junction Harlow Road to Ore Chimney Mine.

18.5 Junction Highway 506 to International Mine, Fernleigh kyanite occurrence, and Boerth Mine.

20.6 Cloyne, at school.

24.6 Junction Mazinaw Inn Road to Star gold mine.

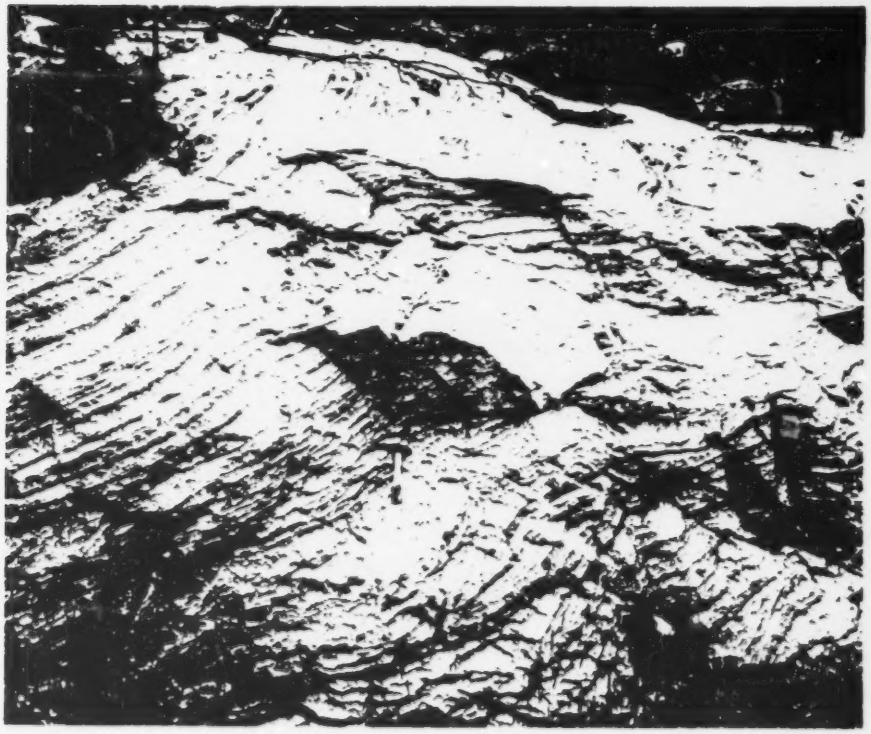


Plate X

Bands of tremolite in crystalline limestone, road-cut Highway 509 at junction Highway 7. (GSC photo 151339)

Golden Fleece (Addington) Mine

GOLD, PYRITE, PYRRHOTITE, ARSENOPYRITE, CHALCOPYRITE, TOURMALINE, GARNET, CALCITE, ACTINOLITE, ANKERITE, APATITE, SERPENTINE, SCHEELITE

In veins at contact of volcanics and conglomerate

Native gold was formerly mined from this deposit. The gold-bearing veins consisted of quartz and carbonates (calcite, ankerite) and contained pyrite, pyrrhotite, arsenopyrite, and chalcopyrite. Vein minerals include: black tourmaline, as slender dark crystals; orange-red granular garnet, white calcite (fluoresces pink when exposed to 'short' ultraviolet ray), radiating bladed actinolite, light green apatite (uncommon), serpentine; and scheelite.

The deposit was discovered in 1881 and was operated intermittently by various companies from 1887 until 1939. Addington Mines Limited was the last operator. The openings consist of several pits, an 24 m shaft and an inclined 160 m shaft with a winze sunk to 236 m; 3.2 km of lateral work was done underground. A 10-stamp mill, machine and diesel shops, and living quarters were erected at the mine but none of these remain today. Specimens may be obtained from dumps adjacent to the openings which extend over a distance of about 550 m.

Road log from Highway 41 at km 7.9 (see page 69):

km		
	0.0	Turn left onto the Flinton road.
	1.7	Junction; turn right onto single-lane road.
	2.3	Junction; continue straight ahead.
	3.2	End of road at mine dump. The openings extend northward from this dump.

Ref.: 30 pp. 70-72

Maps (T): 31 C/11 Kaladar
(G): 51d Grimsthorpe-Kennebec area (O.G.S.)

Ore Chimney Mine

GOLD, PYRITE, GALENA, SPHALERITE, CHALCOPYRITE, ROZENITE, CHLORITE, HORNBLENDE, MICA, FLUORITE

In quartz veins cutting volcanics and sediments

Native gold was found associated with pyrite, galena, brown sphalerite and chalcopyrite in quartz-dolomite veins. Encrustations of white powdery and botryoidal rozenite occur on the metallic minerals on the dumps. Other minerals found on the dumps are chlorite, hornblende, mica and amber coloured fluorite.

Mining operations were conducted intermittently from 1909 until 1932. Underground operations reached a depth of 161 m. A 20-stamp mill was operated briefly in 1915. The head frame still remains at the site. There is a large dump near the shaft.

Road log from Highway 41 at km 14.2 (see page 70):

km		
	0.0	Turn right onto the Harlow Road.
	1.9	Junction single-lane road; turn left.
	2.4	Mine.

Ref.: 56 pp. 42-44

Maps (T): 31 C/14 Mazinaw Lake
(G): 51d Grimsthorpe-Kennebec area (O.G.S.)

International Mine

SPHALERITE, BOULANGERITE, PYRITE, ARSENOPYRITE, GALENA, CHALCOPYRITE, GARNET, MICA, CERUSSITE, DOLOMITE

In quartz at contact dolomitic marble and greywacke

This is a former lead-zinc mine. The ore zone consists of lustrous brown sphalerite, dark grey metallic boulangerite (with iridescent tarnish), pyrite, arsenopyrite, galena and chalcopyrite. Associated minerals include dark brown garnet (5 mm crystals), colourless and light green mica, cerussite (as coating on galena), and dolomite.

The mine was worked in 1902-03 by two shafts (9 m and 35 m deep) and several test pits. There are small dumps near the shafts which are located in a cleared area below a power line.

Road log from Highway 41 at km 18.5 (see page 69):

km		
	0.0	Turn right onto Highway 506.
	7.4	Myer Cave, at junction road to Harlowe; continue along Highway 506.
	11.5	Junction Mississagagon Road; continue along highway.
	13.8	International Mine on left.

Ref.: 56 pp. 41-42

Maps (T): 31 C/14 Mazinaw Lake
(G): 51d Grimsthorpe-Kennebec area (O.G.S.)

Fernleigh Kyanite Occurrence

KYANITE, SILLIMANITE, STAUROLITE, MAGNETITE, CHLORITE

In sericite schist

Plate XI

Ore Chimney gold mine. (GSC photo 151335)

Blue kyanite crystals measuring up to 15 cm in length and 2 to 3 cm in diameter occur in a fine silvery grey schist. Needle-like sillimanite aggregates, brown staurolite crystals (about 2 cm diameter) and small amounts of magnetite and chlorite are associated with the kyanite.

The kyanite-bearing rock is exposed beneath the Ontario Hydro power line near Fernleigh.

Road log from Highway 41 at km 18.5 (see page 69):

km		
	0.0	Turn right onto Highway 506 and proceed toward International Mine.
	13.8	International Mine on left.
	20.6	Fernleigh, at junction Kashewakamak Lake Road; continue along highway.
	21.2	Junction single-lane road on left. This road leads 0.3 km to exposed rocks below the power line.

Ref.: 33 p. 6

Maps (T): 31 C/15 Sharbot Lake
(G): 1956-4 Clarendon-Dalhousie-Darling area (O.G.S.)

Boerth Mine

ARSENOPYRITE, TOURMALINE, PYRITE

In quartz veins at contact diorite and crystalline limestone

Arsenopyrite is closely associated with small crystals and crystal aggregates of black tourmaline in quartz. The arsenopyrite is auriferous. A small amount of pyrite is also present in the orebody.

The mine was worked for gold (about 1900) by some open pits and two shafts, 36.5 and 10.5 m deep. A 10-stamp mill was erected on the site. The mine is located on the farm of Mr. Wilf Hermer of Ardoch.

Road log from Highway 41 at km 18.5 (see page 69):

km		
	0.0	Proceed along Highway 506 toward Fernleigh.
	21.2	Turn-off to Fernleigh kyanite occurrence; continue along highway.
	26.5	Junction; turn left.
	28.2	Gate on left. The mine is located 1.2 km west of the gate and 90 m south of power line.
	28.3	Turn-off to the Wilf Hermer farmhouse. Permission to visit mine may be obtained here.

Refs.: 76 pp. 38-39; 44 p. 111

Maps (T): 31 C/15 Sharbot Lake
(G): 1956-4 Clarendon-Dalhousie-Darling area (O.G.S.)

Star Gold Mine

ACTINOLITE, TOURMALINE, SCHEELITE, PYRITE, CHALCOPYRITE, BISMUTHINITE

In crystalline dolomite (marble)

Attractive specimens of dark green bladed and sheaf-like actinolite occur in white to pink and rose-coloured marble. Quartz veins cutting the marble contain black tourmaline, small amounts of cream-white scheelite, pyrite, chalcopyrite and bismuthinite (rare). Gold is believed to have been associated with the pyrite.

The deposit was mined by a 65 m shaft and a few open cuts in 1903-1907. The mine is also known as the Star of the East Mine.

Road log from Highway 41 at km 24.6 (see page 69):

km		
	0.0	Turn right onto the Mazinaw Inn Road.
	0.5	Fork; bear left.
	0.95	Fork; bear right.
	1.6	Fork; bear right.
	3.0	Junction; turn right.
	3.1	Gate. This gate is locked; to enter contact Mr. Tom Wright of Mazinaw Lake.
	3.2	Fork; bear left.
	3.5	Trail on left. Follow this trail.
	3.7	Mine.

Ref.: 56 pp. 34, 44-47

Maps (T): 31 C/14 Mazinaw Lake
(G): 51d Grimsthorpe-Kennebec area (O.G.S.)

This is the last locality described for the side trip along Highway 41 north of Kaladar.

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km 148.0 Kaladar, at junction Highway 41.

Kaladar Marble Quarry

DIOPSIDE, TREMOLITE, SERPENTINE, TALC, CHLORITE, TOURMALINE, HORNBLENDE, MAGNETITE, PYRITE

In buff dolomitic limestone (marble)

Emerald-green diopside crystals measuring up to 1 cm in diameter and 5 to 10 cm long are found in the marble. The most abundant associated mineral is tremolite which occurs as colourless to light green radiating fibrous masses and bladed aggregates. Serpentine, in yellow and green tones, is common as streaks and bands in the marble. Other minerals found in the rock include talc, chlorite, tourmaline (as colourless tiny crystals that fluoresce bright yellow when exposed to 'short' ultraviolet rays), hornblende, deep pink dolomite, mica, magnetite and pyrite.

The deposit is exposed by two small quarries (now overgrown) 1.2 km apart. They were worked briefly about 50 years ago.

Road log from Highway 7 at junction Highway 41 at Kaladar:

km		
	0.0	Proceed south along Highway 41.
	0.15	Turn right onto single-lane road.
	0.4	Quarry on left.
	1.6	Second quarry.

Ref.: 26 pp. 124-125

Maps (T): 31 C/11 Kaladar
(G): 51d Grimsthorpe-Kennebec area (O.G.S.)

Roblindale Quarry

FOSSILS, CALCITE

In limestone

Ordovician fossils are abundant in dark grey to brownish grey Black River limestone. Corals, bryozoans, brachiopods and crinoids can be found; in places the fossil shells are so abundant as to form coquina limestone. Grey lithographic limestone and shale are also present in the quarry. White crystalline calcite occurs in veins (about 2 cm thick) in the limestone. Similar fossiliferous limestone is exposed in a small quarry on the west side of Highway 41 at a point 3.5 km south of the turn-off to the Roblindale quarry. The quarry belongs to H.J. McFarland Construction Limited.

Road log from Highway 7 at Kaladar (km 148.0):

km		
	0.0	Proceed south along Highway 41.
	37.0	Turn left at railway crossing in Roblindale.
	37.6	Quarry.

Ref.: 34 pp. 61-63

Maps (T): 31 C/6 Tweed
(G): 24-1963 Tweed, Ontario (GSC)

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km		
	159.1 to 160.1	Road-cuts expose marble containing light green tremolite with small amounts of serpentine.
	161.4	Road-cut exposes blue calcite, colourless tremolite and bright green diopside in white marble. Grains of greenish yellow vesuvianite were noted in the calcite.
	161.9 to 163.5	Road-cuts expose marble containing light green tremolite.
	163.8	Road-cuts expose marble containing graphite, mica, pyrite, and hornblende.
	163.95	Junction road to Flinton.
	168.8	Junction Hastings Road 2.

Actinolite Mine

ACTINOLITE

In altered basic lava

An alteration product consisting of actinolite, serpentine, talc and chlorite was formerly mined at this locality and was termed 'actinolite'. It occurs as greyish green to dark green long fibrous aggregates measuring up to 30 cm long. Impurities include magnetite and red hematite.

The deposit was originally worked by Joseph James of Actinolite for use in the manufacture of a roofing material composed of ground actinolite mixed with tar. Operations by Mr. James were intermittent from 1883 until 1908. In 1908 the Actinolite

Mining Company acquired the property and installed a grinding mill in Actinolite. Operations were conducted at intervals until 1929. The 'actinolite' was shipped mostly to the U.S. Several pits were worked but the pit on Mr. Wm. J. Erwin's farm was the last one operated. It is now overgrown and specimens are available only from the walls of the pit.

Road log from Highway 7 at **km 168.8**:

km		
	0.0	Turn right onto Hastings Road 2.
	1.3	Junction on north side of small bridge; turn right.
	2.0	Junction; turn right.
	3.0	Turn-off to the Erwin farmhouse on left. The pit is located in a wooded spot near a spring about 180 m northeast of the farmhouse.

Refs.: 63 pp. 28-29; 91 pp. 92-94

Maps (T): 31 C/11 Kaladar
(G): 51d Grimsthorpe-Kennebec area (O.G.S.)

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km 169.6 Junction Highway 37

Tweed Marble Quarry

TREMOLITE, TALC, MICA, PYRITE

In marble

The marble is white and, in places, banded with aggregates of colourless to light green fibrous and bladed tremolite. Talc occurs in the marble as white scaly masses having a satin lustre. Mica (light green and black) and pyrite were also noted in the deposit.

The quarry is operated by the Ontario Marble Company.

Road log from Highway 7 at **km 169.6**:

km		
	0.0	Proceed south along Highway 37.
	1.9	Junction Hawkins Bay Road; turn right.
	2.2	Junction; bear right.
	3.0	Quarry.

Maps (T): 31 C/11 Kaladar
(G): 24-1963 Tweed, Ontario (GSC)

Tweed Limestone Quarry

FOSSILS, CALCITE

In Ordovician limestone

Fossils including corals, trilobites, brachiopods, and ostracods occur in light grey limestone. Crystalline calcite occurs in veins in the limestone.

The quarry is no longer in operation and is partly overgrown.

Road log from Highway 7 at **km 169.6**:

km		
	0.0	Proceed south along Highway 37.
	7.9	Tweed, at junction Hastings Road 9; turn left.

8.8 Gate on left. The quarry is in a pasture approximately 180 m west of the gate.

Maps (T): 31 C/6 Tweed
(G): 24-1963 Tweed, Ontario (GSC)

Hungerford Mine

PYRITE, JAROSITE

In diorite

Coarsely granular pyrite was formerly mined from this deposit. Yellow powdery jarosite occurs as a coating on the pyrite.

The deposit was originally opened by the American Madoc Mining Company in about 1889 for gold. A smelter was erected on the site but the pyrite was found to contain no gold values. In 1903 the Nichols Chemical Company reopened the mine for pyrite and operated it until 1924. The company also operated a plant for sulphuric acid production from this ore and from ore from the Eastern Townships. The mine was worked by a shaft.

Road log from Highway 7 at **km 169.6** (see page 75):

km

0.0 Proceed south along Highway 37.

7.9 Tweed at junction Hastings Road 9; turn left.

8.8 Gate to Tweed limestone quarry on left.

13.0 Road-cuts expose crystalline limestone containing light green bladed tremolite, mica and white crystalline calcite that fluoresces pink under ultraviolet rays.

21.1 Pyrite dump on left. The site of the smelter is on right.

Plate XII

Quarry operations at Tweed marble quarry, 1968 (GSC photo 151314)

Refs.: 63 pp. 36-37; 89 pp. 62-67

Maps (T): 31 C/11 Kaladar
(G): 25-1963 Kaladar, Ontario (GSC)

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km 172.3 Junction road to Queensboro, Cooper (Hastings Road 12) and to Queensboro soapstone occurrence and Silver King Mine.

Queensboro Soapstone Occurrence

SOAPSTONE, TALC, DOLOMITE, HYDROTALCITE, MAGNETITE

In greenstone lava

Grey soapstone has been exposed in a small pit near Queensboro. The soapstone consists mostly of talc with some chlorite. Colourless scaly and flaky aggregates of talc occur in the soapstone. White, reddish and yellowish dolomite is common. Hydrotalcite occurs as a bright yellow powder on the talc rock and on dolomite. Grains of magnetite were noted in soapstone.

The pit was opened as a prospect many years ago. It is now water-filled and partly overgrown but specimens can be found in the small piles of rock near the pit.

Road log from Highway 7 at **km 172.3:**

km		
	0.0	Proceed north along the road to Queensboro.
	4.8	Junction; continue straight ahead.
	5.1	Lane on right to the Joseph Kelly farmhouse. On left (opposite the lane) a trail leads through the woods for 70 m to the pit.

Maps (T): 31 C/11 Kaladar
(G): 51d Grimsthorpe-Kennebec area (O.G.S.)

Silver King Mine

GALENA, PYRITE, CHALCOPYRITE

With quartz in shear zone

Galena occurs as finely granular masses associated with pyrite and chalcopyrite. The deposit was opened as silver-lead-copper prospect.

The deposit is at the edge of a swamp on the farm of Mr. Roy Cliff. It was originally worked many years ago and was acquired in 1945 by Republic Lead Mines Limited (now Republic Ores and Mining Corporation) who did exploratory work on the deposit. The original opening consists of a 30 m shaft. There is a small dump near the shaft and some collapsed buildings.

Road log from Highway 7 at **km 172.3:**

km		
	0.0	Proceed north along road to Queensboro.
	4.8	Junction; continue straight ahead.
	5.1	Queenboro soapstone occurrence on left.
	6.7	Junction; continue straight ahead.
	7.4	Junction; turn right.
	14.6	Hamilton farmhouse on left; continue straight ahead.
	15.3	Junction single-lane road on left. Proceed along this road (not accessible for automobiles).
	16.6	End of road at mine.

Maps (T): 31 C/11 Kaladar
(G): 25-1963 Kaladar (GSC)
51d Grimsthorpe-Kennebec area (O.G.S.)

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km	172.6	Road-cuts expose dark grey banded marble containing white tremolite partly altered to talc.
	173.1	Road-cut on left exposes biotite schist. Bornite was noted associated with quartz in the schist.
	173.8	Junction Black River Road.
	177.3	Junction Hunt Club Road to Canadian Sulphur Mine, Blakely Mine and Sophia Mine, and to the Hazzards Corner quarries.

Canadian Sulphur (Wellington) Mine

PYRITE, PYRRHOTITE, CHALCOPYRITE, GYPSUM, JAROSITE

At contact of schist and quartzite and in slate

Massive pyrite is associated with small amounts of pyrrhotite and chalcopyrite at this former pyrite mine. Gypsum occurs as a white encrustation on the ore-bearing rocks, and jarosite occurs as a yellow powdery coating on slate.

The deposit was opened in 1906. A 3.6 m layer of limonite gossan containing pyrite boulders (up to 3.6 m in diameter) covered the deposit and the pyrite orebody was mined below it. Development included three shafts (22.8, 30.5 and 140 m deep) and two open cuts. The ore yielded 35 to 49 per cent sulphur which was used for the production of sulphuric acid. Canadian Sulphur Ore Company operated the deposit from 1910 until 1919. It has since been idle. There are large dumps adjacent to the openings.

Road log from Highway 7 at **km 177.3**:

km	0.0	Turn right onto the Hunt Club Road.
	1.9	Junction; turn right.
	4.7	Turn-off (left) to the S. Ralph Hennessey farmhouse. Obtain permission to visit the mine. The first shaft is located 365 m west of the farmhouse, the others 120 m farther west. They are in the wooded area.

Refs.: 34 p. 11; 41 p. 26; 89 pp. 68-69

Maps (T): 31 C/11 Kaladar
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Blakely (Queensboro) Pyrite Mine

PYRITE, CHALCOPYRITE, JAROSITE

Massive pyrite is associated with small amounts of chalcopyrite. On the dumps, specimens coated with yellow jarosite can be found.

The deposit was worked for pyrite by the British American Development Company from 1905 until 1908. Two shafts were sunk to depths of 4.1 m and 9 m. The ore averaged 45 per cent sulphur.

Road log from Highway 7 at **km 177.3**:

km	0.0	Turn right onto the Hunt Club Road.

1.9 Junction; turn right.

4.7 Turn-off (left) to Ontario Sulphur Mine; continue straight ahead.

5.6 Junction; continue straight ahead.

6.0 Blakely Mine on right approximately 60 m from road.

Refs.: 41 p. 27; 89 pp. 67-68

Maps (T): 31 C/11 Kaladar
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Sophia (Diamond) Mine

ARSENOPYRITE, PYRITE, PYRRHOTITE, CHLORITE

In quartz vein cutting volcanic rocks

Arsenopyrite and gold were found in this property in 1896. Other minerals occurring in the quartz are pyrite, pyrrhotite, chlorite and dolomite.

The deposit was worked for gold between 1896 and 1901 by two shafts (18 m and 32 m deep). There are small dumps near the openings.

Road log from Highway 7 at km 177.3 (see page 78):

km 0.0 Turn right onto the Hunt Club Road and proceed to Blakely Mine.

6.0 Blakely Mine on right; continue straight ahead.

7.6 Junction; turn left.

8.0 Turn-off (right) to Sophia Mine. Proceed from old farmhouse north through the pasture for 460 m to the first shaft. The second shaft is located about 600 m northwest of the first one.

Refs.: 41 p. 21; 44 p. 107

Maps (T): 31 C/11 Kaladar
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Hazzards Corner Marble Quarries

MARBLE

Cream-white and buff to reddish dolomitic marble was formerly obtained from two quarries on the Rimington Road near Hazzards Corner. Deep red bands and streaks in the marble are due to finely disseminated hematite. The marble contains a few grains of pyrite, quartz and mica. The marble with the maroon red streaks is very attractive and is suitable for use as a polished ornamental stone. The operators of the quarries were Stoklosar Marble Quarries and Madoc Marble Quarries.

Road log from Highway 7 at km 177.3 (see page 78):

km 0.0 Proceed north along the Hunt Club road and follow log to the Blakely and Sophia mines.

8.0 Turn-off to Sophia Mine; continue straight ahead.

11.7 Junction; turn right.

13.0 Junction at Hazzards Corner; turn right onto Rimington Road.

13.4 Stoklosar Marble Quarries property on right.

15.5 Madoc Marble Quarries property on right.

Ref.: 38 pp. 46-47

Maps (T): 31 C/11 Kaladar
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

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km 177.8 Road-cuts expose pink marble.

178.3 to 178.4 Road-cuts expose pink, grey and white banded marble containing salmon-pink calcite, colourless mica, green serpentine, and pyrite. A crystal of dark green epidote (about 2 cm long) was found in the serpentine.

178.8 Junction Pinewood Park Lake Road

Pinewood Park Lake Road Quarries

MARBLE

Two dolomitic marble quarries were formerly operated along the Pinewood Park Lake Road. In the quarry on the east side of the road, the marble is predominantly cream-white and grey, and contains small amounts of white calcite, colourless and light green mica and pyrite. Transparent, yellow barite was noted in the calcite. The marble in the quarry on the west side of the road is an attractive rose colour; grey and buff marble are also present. Aggregates of light green mica are common. Small, brown crystals of tourmaline (up to 2 cm long) occur with the mica in brownish grey marble.

The quarries, now inactive, were operated by Grenville Aggregate Specialties Limited.

Road log from Highway 7 at km **178.8**:

km 0.0 Proceed south along the Pinewood Park Lake Road.

0.3 White marble quarry on left.

0.4 Gate on right. Proceed through pasture for approximately 275 m to the pink marble quarry on the east side of a gentle slope.

Refs.: 38 p. 45; 41 pp. 24-25

Maps (T): 31 C/11 Kaladar
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

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km 180.0 Junction Concession VIII Road and turn-off to Madoc.

181.4 Junction. Road on left leads to Henderson and Conley mines; road on right leads to St. Charles Mine.

Henderson and Conley Talc Mines

TALC, TREMOLITE, MICA, CALCITE, PYRITE, TOURMALINE, RUTILE, ZIRCON, TITANITE, ARSENOPYRITE

In dolomitic marble

Talc occurs as white, light green, grey and light brown masses in marble. Foliated, flaky, fibrous and fine-grained varieties are found. The most abundant associated

mineral is tremolite which occurs as light green prismatic and fibrous aggregates; individual crystals measure up to 8 cm long. Other minerals commonly associated with the ore are mica, calcite (scalenohedrons), pyrite and brown tourmaline. Zircon, titanite and arsenopyrite have been found in the deposit. Madocite, a rock consisting mainly of brown tourmaline, mica, tremolite and plagioclase, occurs in dykes intruding the marble. Rutile has been reported from a quartz vein at the Henderson Mine.

The talc deposit was discovered in the 1880s and mining operations have been continuous since 1896 when the Henderson Mine was opened. The adjacent Conley Mine has been operated since 1911. Various companies operated the mines until 1937 when Canada Talc Industries Limited, the current operator, took over operations. The original operations were from open pits on the Henderson property. Underground methods were employed after 1908 and four shafts were sunk, two of which have since caved in. The shaft at the Conley Mine is 186 m deep, that at the Henderson 165 m deep. The underground operations at the two mines are connected by a crosscut. The mines are about 275 m apart. Total annual production of talc is about 18,000 t. Terrazzo is produced from the marble.

Road log from Highway 7 at **km 181.4** (see page 80):

km	
0.0	Turn left onto secondary road.
0.6	Junction old Highway 7; continue straight ahead.
1.1	Junction; turn left.
1.6	Turn-off, on right, to Canada Talc Industries Limited property. The first mine is the Conley Mine; the Henderson Mine is located 275 m to the south.
1.7	Office on left. Obtain permission from office to collect specimens from dumps.

Plate XIII

Conley talc mine. (GSC photo 151307)

Refs.: 41 pp. 30-37; 71 pp. 59-78; 81 pp. 68-72; 91 pp. 78-89

Maps (T): 31 C/11 Kaladar
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

St. Charles Mine

HEMATITE, MAGNETITE, MARTITE, PYRITE, CHLORITE

In carbonate rock associated with rhyolite and granite

Earthy reddish brown hematite occurs with magnetite at this former iron mine. Some specularite is also present. Other minerals associated with the ore are martite, pyrite, chlorite and calcite.

The deposit was worked from an open pit that measures 61 m by 6 m and is 6 m deep. There is a large dump adjacent to it. The mine was operated in 1898 and 1899. It is located on the farm of Mr. A. Walsh.

Road log from Highway 7 at **km 181.4** (see page 80):

km		
	0.0	Turn right (north) onto secondary road.
	0.9	Junction; continue straight ahead.
	1.4	Turn-off (left) to Mr. A. Walsh's farmhouse. Obtain permission to visit mine.
	1.9	Junction; turn left.
	2.2	Gate on left. The mine is located on a gentle wooded slope about 400 m south of this gate.

Refs.: 41 p. 23; 66 pp. 63-64

Maps (T): 31 C/11 Kaladar
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

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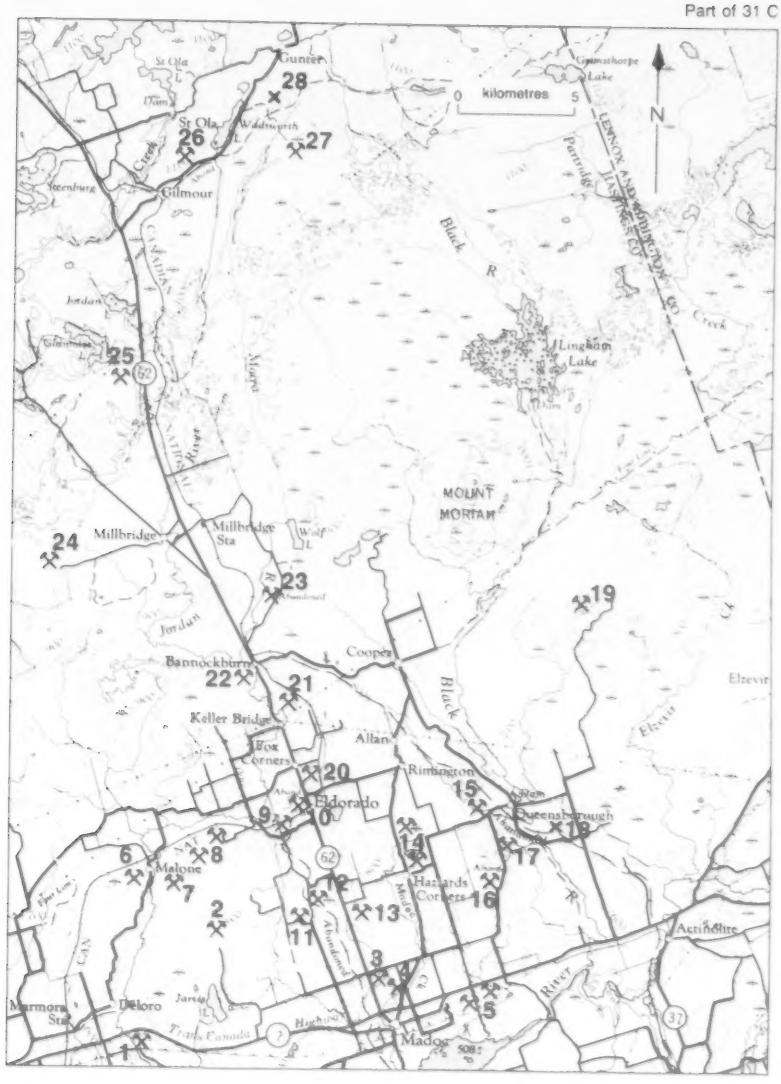
km		
	182.1	**Road-cuts expose pink and grey marble.**
	182.8	**Intersection Highway 62.**

Occurrences along Highway 62

Road log for side trip along Highway 62 North (underlined localities are described in text following log):

km		
	0.0	Proceed north along Highway 62.
	1.0	Gate to Stoklosar quarry on right.
	1.8	Intersection; road on right leads to Slate quarry.
	4.8	Junction (on right) to Curtis quarry.
	6.1	Junction road on left. A water-filled pit on the south side of the junction marks the location of the old Wallbridge hematite mine, now inaccessible.
	8.2	Road-cuts and quarry on left (behind cuts) expose light grey Black River (Ordovician) limestone containing a few crinoids.
	9.2	Eldorado, at turn-off (left) to Richardson Mine and to Eldorado Mine.

Part of 31 C



Map 8

Madoc-Gilmour area

1. Ackerman Mine
2. Freeman quarry
3. Slate quarry
4. St. Charles Mine
5. Pinewood Park Lake Road quarries
6. McCann quarry
7. Malone quarries
8. Hobson-Nelson-Knob Mine
9. Eldorado Mine
10. Richardson Mine
11. Madoc marble quarry
12. Seymour Mine
13. Curtis quarry
14. Hazzards Corners quarries
15. Sophia Mine
16. Canadian Sulphur Mine
17. Blakely Mine
18. Queensboro talc occurrence
19. Silver King Mine
20. Blackburn quarry
21. Bannockburn pyrite mine
22. Bannockburn gold mine
23. Hollandia Mine
24. Katherine Mine
25. St. Charles (magnetite) Mine
26. Gilmour Mine
27. Gilmour gold mine
28. Trumble lead occurrence

9.8 Junction Hastings Road 20.

10.0 Road-cuts expose grey and cream-white marble containing crystalline aggregates of white barite with calcite and quartz.

10.3 Road-cut on left exposes green, grey and white siliceous marble containing white crystalline calcite that fluoresces pink under 'short' ultraviolet rays.

11.1 Junction Hastings Road 11 to Blackburn quarry and to Hobson-Nelson-Knob Mine.

12.8 Bridge over Moira River. Pink marble is exposed in a road just north of this bridge.

14.3 Junction (on right) road to Bannockburn pyrite mine.

14.6 Road-cut on right exposes greenish grey marble containing crystalline calcite that fluoresces bright pink when exposed to 'short' ultraviolet rays.

15.9 Bannockburn, at junction road to Cooper.

16.0 Bannockburn, at junction (on left) road to Bannockburn gold mine.

16.7 Junction (on right) road to Lost Acres Camp and to Hollandia Mine.

20.0 Junction Millbridge Road.

23.0 Junction Glanmire Lake Road to Katherine Mine.

27.5 Road-cuts expose grey and white marble containing calcite, light green tremolite, green serpentine, mica and graphite (in calcite).

30.6 Junction trail on left to St. Charles magnetite mine.

35.9 Junction West Weslemkoon Lake Road to Gilmour and to Gilmour iron mine, Trumble occurrence, Talc mine, and Rainbow quarry.

47.9 Junction Highway 620 to Coehill Mine and Black Rock Mine.

62.9 Junction Deltor and Faraday roads.

64.0 Road-cuts expose light green and grey marble containing bands of tremolite, and coarsely crystalline white calcite that fluoresces bright pink under 'short' ultraviolet rays.

66.9 Road-cut on left exposes light green and white marble. Bladed aggregates of colourless tremolite occur in the marble.

67.5 Junction Quarry Road to Steward quarry and to McMillan quarry.

70.8 Bancroft, at junction Highway 28.

Stoklosar (Highway 62) Quarry

MARBLE

Black calcitic marble was formerly quarried by Stoklosar Marble Quarries Limited. Small amounts of pyrite were found in the rock.

The quarry is located in a pasture about 90 m east of Highway 62 at km 1.0 (see page 82).

Ref.: 38 pp. 39-40

Maps (T): 31 C/11 Kaladar
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Slate Quarry

SLATE

Dark grey slate was formerly obtained from this deposit. Fine-grained garnet schist is interbedded with the slate. The quarry was operated in the 1930s. Slate was used for roofing and for flagstones.

Road log from Highway 62 at km 1.8 (see page 82):

km		
	0.0	Turn right.
	0.15	Turn-off (right) to quarry.
	0.25	Quarry.

Ref.: 41 p. 28

Maps (T): 31 C/11 Kaladar
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Curtis Quarry

SERPENTINE, TREMOLITE, ACTINOLITE, MAGNETITE, HEMATITE, TOURMALINE, PYROAURITE, HYDROMAGNESITE

In marble

Attractive serpentine suitable for lapidary purposes is found in cream-white, buff, and light to dark green marble. The serpentine is yellow-green to dark green and some of it is translucent; attractive cabochons have been cut of the translucent variety. Hematite occurs as deep red coatings and patches in serpentine. Colourless to light green tremolite and dark green actinolite occur abundantly as radiating and stellate aggregates in the marble. Magnetite occurs as small grains and radiating needle-like aggregates. Lustrous black tourmaline crystals are common in the marble; they are slender, barrel-shaped or 6-sided and average 3 cm long. Pyroaurite occurs as blue fibrous aggregates, hydromagnesite as silky white scaly coatings on the marble.

The deposit was formerly quarried by Stoklosar Marble Quarries.

Road log from Highway 62 at km 4.8 (see page 82):

km		
	0.0	Turn right (east) onto Hazzards Road.
	0.4	Gate on right. Proceed along road through pasture.
	0.6	Quarry.

Ref.: 38 pp. 40-41

Maps (T): 31 C/11 Kaladar
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Richardson Mine

GOLD, PYRITE

In quartz veins cutting quartzite, granite

Native gold, in the form of leaves, sheets and nuggets (the size of a butternut), was at one time found in this deposit. Pyrite was associated with it.

The discovery of gold in this deposit in 1866 marked the first time gold had been reported from the Canadian Shield. Mr. Marcus Herbert Powell, a clerk of the Division Court in Marmora and a knowledgeable prospector, discovered the deposit while prospecting for copper. The discovery sparked a gold rush in the Madoc-Marmora area and other deposits were subsequently discovered. This mine was worked only until 1868 and has recently been designated an Historical Site. It it now fenced off and inaccessible.

Road log from Highway 62 at Eldorado (km 9.2, see page 82):

km 0.0 Turn left at sign indicating historical plaque.

0.15 Park automobile and follow trail on right to mine.

Ref.: 7 pp. 53-55

Maps (T): 31 C/12 Bannockburn
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Eldorado Mine

CHALCOPYRITE, CHALCOCITE, PYRITE, HEMATITE, MAGNETITE, MARTITE

At contact of granite and crystalline limestone

This deposit was originaly worked for hematite which occurred near the surface of the pit. Red hematite is associated with magnetite and martite in quartz-carbonate veins. Crystals of magnetite line vugs in the quartz. About 18 m from the surface, copper ore was encountered and the deposit was worked for copper. Chalcopyrite, chalcocite and pyrite were found in the copper orebody.

The deposit was operated from 1901 until 1903 for iron and was known as the Coe iron mine. Hematite was obtained from three open cuts, the largest measuring 18 m by 15 m and 23 m deep. In 1903, the copper ore was discovered and a 23 m shaft was sunk from the bottom of the pit. The mine became known as the Eldorado copper mine and was operated until 1907. In 1906 a copper smelter was built at the mine site. At present, the pit is fenced off; there are small dumps near this pit and near the two smaller ones. The mine is located on a wooded ridge 460 m west of the parking area at the Richardson Mine.

Refs.: 41 pp. 21-22; 66 pp. 60-62

Maps (T): 31 C/12 Bannockburn
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Hobson-Nelson-Knob Mine

MAGNETITE, PYRRHOTITE, HEMATITE, LIMONITE, SPHALERITE

In sheared crystalline limestone

Massive magnetite is associated with pyrrhotite in this deposit. Some of the magnetite has a sponge-like appearance and has vugs lined with hematite, limonite, chert and calcite. Hematite and black sphalerite occur with the magnetite.

The deposit occurs just north of granite exposures on a ridge. It was exposed over 95 years ago by a series of pits and a shaft. The openings constituted the Hobson, the Nelson, and the Knob mines. They are now overgrown. There is a small dump near the shaft.

Road log from Highway 62 at km 11.1 (see page 84):

km		
	0.0	Turn left (west) onto Hastings 11 Road.
	2.9	Junction; continue straight ahead.
	5.0	Junction; turn left.
	5.5	Junction; continue straight ahead.
	5.8	Trail on left leads 180 and 405 m to old pits; there is a dump 68 m to the right of the junction of the trail and the road.

Ref.: 66 pp. 40, 42

Maps (T): 31 C/12 Bannockburn
(G): 2154 Madox Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Blackburn Quarry

MARBLE

Pink, grey and white banded marble was formerly quarried on this property by Madox Marble Quarries Limited. The quarry measures 7.6 by 12.2 m. It is on the farm of Mr. Gerald Blackburn.

Road log from Highway 62 at km 11.1 (see page 84):

km		
	0.0	Turn right (east) onto Hastings 11 Road.
	0.8	Turn-off, on right, to the Blackburn farm. The quarry is behind the barn.

Ref.: 38 pp. 42-43

Maps (T): 31 C/12 Bannockburn
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Bannockburn Pyrite Mine

PYRITE, MAGNETITE, HALOTRICHITE, COPIAPITE, COQUIMBITE

In chlorite schist

Finely granular massive pyrite occurs with quartz and calcite in schist. Small grains of magnetite occur in quartz. Secondary minerals occurring as encrustations on ore specimens include: copiapite, as yellow crystalline aggregates; coquimbite, as white botryoidal crusts; and halotrichite, as white hair-like masses.

The deposit was worked for iron by Stephen Wellington from 1898 until 1899. Iron was obtained from a 2.5 to 4.5 m limonite gossan layer that covered the site of the present mine. The American Madoc Mining Company conducted mining operations for pyrite, first from a pit (1900-1901) and later from a 83.8 m shaft (1901-1907) located 150 m to the south. The open pit measures 9.7 by 25.9 m and is 25.6 m deep; it is now water-filled. Both mines were closed due to unsafe mining conditions. The ore averaged 40 per cent sulphur. Specimens can be collected from a large dump near the shaft. The mine was also known as the Jarman or the Mundic Mine.

Road log from Highway 62 at km 14.3 (see page 84):

km		
	0.0	Turn right (east) at red house and proceed along single-lane road.

0.25 End of road at the Marshall house. Obtain permission to go through property. Continue straight ahead on foot to gate. Proceed through gate and along trail for about 450 m to the pit near a swamp (second right fork in the trail). The shaft is on the south side of the swamp.

Refs.: 41 pp. 25-26; 83 pp. 65-66

Maps (T): 31 C/12 Bannockburn
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Bannockburn Gold Mine

GOLD, PYRITE, MALACHITE, HORNBLENDE, DOLOMITE

In quartz vein at contact between schist and syenite

Rich specimens of gold were obtained from the deposit during mining operations. Minerals now found on the dumps include pyrite, malachite (as coatings on pyrite), hornblende (small crystals in quartz), and dolomite.

The gold-bearing vein was mined by four shafts (the deepest being 22.8 m) and several open cuts over a distance of 213 m. Operations were conducted from 1894 until 1898. A 10-stamp mill was installed at the site.

Road log from Highway 62 at km 16.0 (see page 84):

km 0.0 Turn left (west) onto road to sawmill. Obtain permission from owner of sawmill to visit mine. Proceed on foot from sawmill.

0.5 Mine shaft and dump. Continue along road to other openings.

Refs.: 41 p. 21; 83 p. 32

Maps (T): 31 C/12 Bannockburn
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Hollandia Mine

GALENA, PYRITE, SPHALERITE, BARITE, CALCITE, CERUSSITE, ANGLESITE

In veins cutting paragneiss and schist

Massive galena occurs with pyrite and sphalerite in calcite. Crystals of galena can also be found. White barite is present in small amounts. The calcite fluoresces bright pink when exposed to 'short' ultraviolet rays. Cerusite and anglesite occur as a greyish white coating on the galena. Magnetite specimens containing pyrite and coated with malachite and goethite were found on the dumps.

The deposit was developed by several open-cuts and four shafts (40, 27, 20 and 12 m deep) over a distance of 122 m. It was mined between 1898 and 1907, and was drilled in 1956 by Teck Exploration Company, Limited. A reduction plant was in operation at the mine site.

Road log from Highway 62 at km 16.7 (see page 84):

km 0.0 Turn right (west) onto the road to Lost Acres Camp.

2.4 Junction single-lane road on left; turn left.

2.6 Shaft. The other openings are located north of this one.

Refs.: 1 pp. 155-157; 41 p. 24

Maps (T): 31 C/12 Bannockburn
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Katherine Mine

GALENA, SPHALERITE, PYRITE, BARITE, CALCITE, CERUSSITE, HYDROCERUSSITE

In vein cutting diorite

Argentiferous galena, dark brown sphalerite and pyrite occur in a calcite-barite vein. The calcite varies from white to pink; the white calcite fluoresces bright pink when exposed to 'short' ultraviolet rays. Barite occurs as colourless, white and pink platy aggregates in calcite. Some of the galena is coated with buff-coloured waxy encrustations consisting of cerussite and hydrocerussite.

The mine was opened for galena in 1899 and was worked again in 1910 and 1925. A shaft was sunk to a depth of 38 m and another (800 m to the south) to 5.5 m. In 1937 Katherine Lead Mines Limited took over the property, built a mining camp and examined the workings. It has since remained idle. The shaft is inacessible and there is now a very small dump at the site. None of the buildings remain.

Road log from Highway 62 at km 23.0 (see page 84):

km		
	0.0	Turn left (west) onto the Glanmire Lake Road.
	1.1	Millbridge at crossroad; continue straight ahead.
	1.5	Fork; bear right.
	5.1	Fork; bear right.
	5.8	Farmhouse on right; continue straight ahead along single-lane road.
	6.4	Mine.

Refs.: 1 pp. 157-158; 50 pp. 27-28; 83 p. 54

Maps (T): 31 C/12 Bannockburn
(G): 2106 Lake Township, Hastings County (O.G.S., 1 inch to 1/2 mile)

St. Charles Magnetite Mine

MAGNETITE, GARNET, PYRITE, PYRRHOTITE, HORNBLENDE, PYROXENE

At contact of crystalline limestone and gabbro

Coarsely granular magnetite occurs with brown garnet, pyrite, pyrrhotite (uncommon), hornblende, pyroxene and calcite.

The deposit was worked from four small pits for iron in 1900. The ore yielded 57 to 60 per cent iron; about 2700 t were produced. The pits, now overgrown, are in a wooded area west of Highway 62.

Access is by an old trail that leads west from the highway at km 30.6 (see page 84). This is about 0.3 km south of the point where the hydro line across the highway. The pits are on the south of the trail approximately 300 m from the highway.

Refs.: 66 pp. 53-54; 83 pp. 47-48

Maps (T): 31 C/13 Coe Hill
(G): 52b North Hastings area (O.G.S., 1 inch to 2 miles)

Gilmour (Emily) Mine

MAGNETITE, PYROXENE, GARNET, EPIDOTE, PYRITE, SPECULARITE

In skarn zone between crystalline limestone and granite

Small amounts of magnetite are associated with dark green pyroxene, brown garnet, yellow-green epidote, and pyrite. Specularite is also present. The deposit was opened for iron by a cut measuring 38 m by 4.5 m. The mine, now overgrown, is on the south side of a wooded ridge. A small dump lies nearby.

Road log from Highway 62 at km 35.9 (see page 84):

km		
	0.0	Turn right onto the West Weslemkoon Lake Road.
	2.4	Gilmour, at junction; turn right after crossing bridge.
	4.8	Clearing in meadow on left. Walk through this clearing for approximately 275 m to the mine at the side of the ridge.

Refs.: 66 pp. 35-36; 83 p. 49

Maps (T): 31 C/13 Coe Hill
(G): 52b North Hastings area (O.G.S., 1 inch to 2 miles)

Trumble Lead Occurrence

GALENA, PYRITE, HEMATITE, BARITE, FLUORITE, MALACHITE, AZURITE, CALCITE

In fracture between limestone and diorite

Small crystals of galena occur with pyrite and small amounts of hematite in white calcite that fluoresces bright pink when exposed to ultraviolet rays ('short' rays more effective than 'long' rays). White and pink barite and light green transparent fluorite (uncommon) are also found in the calcite. Malachite and azurite occur as small irregular coatings on the calcite and on limestone.

The deposit was exposed by a test pit and a trench. There are two small dumps nearby. The occurrence is on the G. Trumble farm, approximately 90 m east of the house.

Road log from Highway 62 at km 35.9 (see page 84):

km		
	0.0	Turn right onto the West Weslemkoon Lake Road.
	2.4	Gilmour at junction beyond bridge; turn right.
	5.5	Junction; bear left.
	8.0	Junction single-lane road on right leading 3.4 km to the old Gilmour gold mine which is not accessible due to a swamp at the mine site; continue on main road.
	9.3	Turn-off to the G. Trumble farmhouse on right.

Ref.: 83 p. 54

Maps (T): 31 C/13 Coe Hill
(G): 52b North Hastings area (O.G.S., 1 inch to 2 miles)

Talc Mine

TALC, DOLOMITE, CHLORITE, ACTINOLITE

In amphibolite

Light green to grey massive talc occurs with dolomite, chlorite, and dark green actinolite. Green foliated talc is also present.

A 90-foot shaft was sunk on the deposit in 1938 by the Madoc Talc and Mining Company.

Road log from Highway 62 at km 35.9 (see page 84):

km		
	0.0	Turn right onto the West Weslemkoon Lake Road, and follow log to the Trumble occurrence.
	9.3	Turn-off to the Trumble property; continue straight ahead.
	12.2	Junction; turn left.
	13.0	Junction; turn right.
	20.1	Junction; turn left onto Forest Access Road to McArthurs Mills.
	21.4	Fork; bear right
	24.3	Metal house on left. Mine is on right about 45 m north of the house.

Ref.: 54 pp. 41-45; 81 pp. 75-76

Maps (T): 31 C/13 Coe Hill
(G): 2142 Cashel Township, Hastings County (O.G.S., 1 inch to 1/2 mile)

Rainbow Quarry

MARBLE

The marble is white crystalline limestone with light brown and light green bands which are due to aggregates of brown mica and of green chlorite and serpentine.

The rock is exposed by a small quarry on the McArthur Mills Road opposite Smith Lake.

Road log from Highway 62 at km 35.9 (see page 84):

km		
	0.0	Turn right onto the West Weslemkoon Lake Road and follow log to the talc mine.
	24.3	Talc mine on left.
	25.1	Rock exposure on left exposes tremolite in talc schist.
	27.7	Junction; continue straight ahead.
	32.1	Rainbow quarry on left.

Maps (T): 31 F/4 Bancroft
(G): 52b North Hastings area (O.G.S., 1 inch to 2 miles)

Coehill Mine

MAGNETITE, PYRITE, PYROXENE, HORNBLENDE, ROZENITE, JAROSITE, GOETHITE

In metamorphic pyroxenite

Coarsely granular masses of magnetite occur with massive pyrite and with pyroxene and hornblende. Pyroxene is finely granular massive and emerald green in colour. Black hornblende crystals were found with calcite on magnetite-pyroxene rock. Secondary iron minerals have formed on ore specimens on the dumps. These minerals include rozenite as white botryoidal encrustations, jarosite, as yellow powdery coatings, and goethite, as rusty, earthy patches.

The deposit was worked for iron from 1884 until 1887. An open pit measuring 183 by 4 to 9 m and three shafts (to depths of about 30 m each) were used. Approximately 90 700 t of magnetite were mined and about a third of that was stockpiled.

Road log from Highway 62 at km 47.9 (see page 84):

km		
	0.0	Turn left onto Highway 620 to Coe Hill.
	11.1	Coe Hill, at junction Wollaston Lake Road; continue straight ahead.
	12.1	Coe Hill, at junction single-lane road on left; turn left.
	12.2	Fork; bear right.
	12.6	Mine.

Refs.: 36 p. 53; 66 pp. 33-34; 83 pp. 51-52

Maps (T): 31 C/13 Coe Hill
(G): 2020 Wollaston Township (O.G.S., 1 inch to 1/2 mile)

Black Rock Mine

MAGNETITE, PYRITE

In amphibolite

Massive magnetite occurs with a little pyrite in dark amphibolite.

The deposit was opened over 75 years ago by a side hill cut measuring 16 m by 6.5 m. It was recently investigated by Ventures Limited and by the Black Rock Mining Company.

Road log from Highway 62 at km 47.9 (see page 84):

km		
	0.0	Proceed west along Highway 620 and follow log to Coehill Mine.
	12.1	Turn-off to Coehill Mine; continue straight ahead.
	14.3	Junction; turn left onto Wollaston Lake South Road.
	18.2	Turn-off to Wm. Bachelor property on right. Granite quarries were formerly operated on the Bachelor property. Continue straight ahead to reach iron mine.
	25.4	Junction; bear right.
	29.3	Junction single-lane road on left; turn left. This road is not accessible for automobiles.
	30.4	Mine.

Ref.: 75 p. 26

Maps (T): 31 C/13 Coe Hill
(G): 2019 Chandos Township (O.G.S., 1 inch to 1/2 mile)

Stewart Quarry

MARBLE

The marble is predominantly white with light green veins and streaks due to tremolite and serpentine. This marble was sold under the name "Imperial Green". Radiating aggregates of tremolite are found in the marble. Other varieties of marble that were formerly quarried include light blue marble veined with white, and brownish pink banded marble. Brown tourmaline has been reported to occur in mica-rich layers in the marble.

The quarry was opened about 75 years ago but has not been operated recently. It measures 48.7 m by 24.4 m and is now overgrown. A mill was operated near the quarry.

Road log from Highway 62 at km 67.5 (see page 84):

km		
	0.0	Turn right onto Quarry Road.
	1.3	Junction, on right, single-lane road; turn right.
	1.8	Fork; bear right and proceed 180 m to the quarry opposite a swamp.

Ref.: 38 pp. 21-22

Maps (T): 31 F/4 Bancroft
(G): 1955-8 Dungannon and Mayo townships (O.G.S., 1 inch to 1/2 mile)

McMillan Quarry

MARBLE

The marble is medium-grained white dolomitic crystalline limestone. Aggregates of colourless to light green tremolite occur in the marble.

The quarry measures 18.3 m by 36.5 m and is 12.2 m deep. It is now water-filled, and blocks of weathered marble surround it.

Road log from Highway 62 at km 67.5 (see page 84):

km		
	0.0	Turn right onto Quarry Road.
	1.3	Turn-off to Stewart quarry; continue straight ahead.
	1.45	Junction trail to McMillan quarry; turn right and proceed 0.25 km to the quarry.

Ref.: 38 pp. 20-21

Maps (T): 31 F/4 Bancroft
(G): 52b North Hastings are (O.G.S., 1 inch to 2 miles)

This is the last occurrence described for the side trip along Highway 62 North.

Occurrences along Highway 62 South

Road log for side trip along Highway 62 South (underlined localities are described in the text following log):

km		
	0.0	Junction Highways 7 and 62; proceed south along Highway 62.
	1.6	Junction Seymour Street to Rogers, Kilpatrick, Bailey, Keen, McIlroy, Wallbridge mines, and to Stoklosar quarries.
	3.6	Junction on right, to Perry and Coe mines, on left to Perry Lake Mine.
	4.3	Road-cuts expose grey, white, and pink banded marble.
	5.1	Road-cuts expose light grey limestone containing crinoids.
	5.3	Turn-off (right) to Blakely Mine.
	6.2	Junction Huntingdon Concession XII Road to Noyes and Howard mines.
	9.9	Junction road to Crookston and Crookston quarry.

Rogers Mine

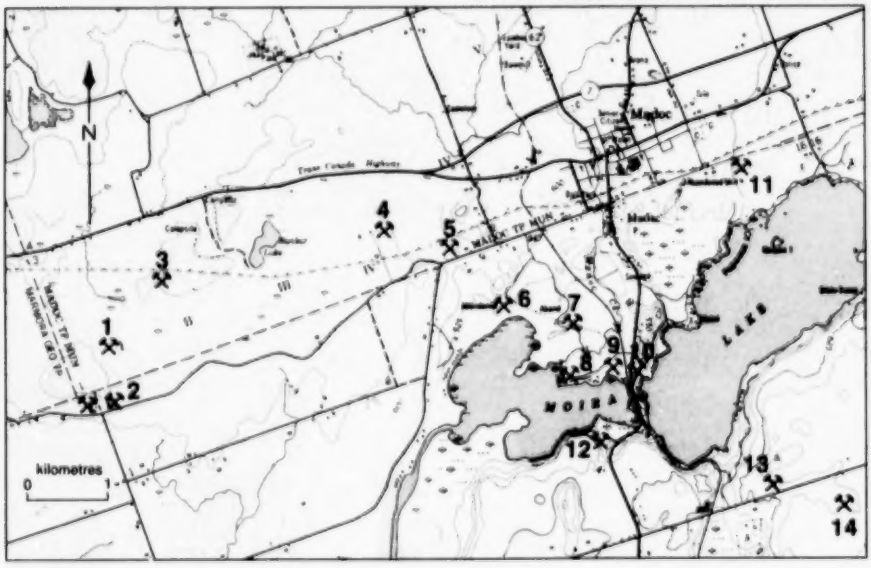
FLUORITE, BARITE, CALCITE, SPHALERITE, PYRITE, CELESTINE, BOULANGERITE

In vein in dolomitic marble

The fluorite is light green, colourless, yellow, and less commonly, mauve. It occurs with white platy barite in coarsely crystalline white calcite that fluoresces bright pink when exposed to ultraviolet rays ('short' rays more effective than 'long'). Associated minerals occurring in small amounts include sphalerite, pyrite, celestine and boulangerite. The boulangerite occurs as wire-like aggregates in fluorite.

The deposit was discovered in 1909 by Donald Henderson and Chesley Pitt of Madoc. Between 1910 and 1914 it was mined from an open pit. In 1914 a shaft was sunk but the mine remained inactive until 1943 when Reliance Fluorspar Mining Syndicate Limited took over operations until 1951. This was the mine's most productive period and four shafts (37.5, 26.5, 36.5 and 73 m deep) were sunk. Some 39 000 t of ore were produced during this period making this the leading fluorite producer in the Madoc area. Some of the old buildings remain on the site. There are large dumps near the shafts. The property belongs to Mrs. Symon of Madoc.

Parts of 31 C/5E, 31 C/6W, 31 C/11W, and 31 C/12E



Map 9

Madoc fluorite, talc mines

1. Wallbridge Mine
2. Stocklosar (Marmora Road)
3. Dominion Mine
4. McIlroy Mine
5. Bailey Mine
6. Keen Mine
7. Kilpatrick
8. Rogers Mine
9. Coe Mine
10. Perry Mine
11. Perry Lake Mine
12. Henderson and Conley Mines
13. Blakely Mine
14. Noyes Mine
15. Howard Mine

Road log from Highway 62 South at km 1.6 (see page 93):

km		
	0.0	Turn right onto Seymour Street.
	1.4	Junction single-lane road; turn left.
	1.7	Fork; bear left.
	2.8	Mine. Three shafts are located here; the fourth and deepest is located 140 m to the northwest.

Refs.: 16 p. 2; 29 pp. 49-50; 92 p. 64

Maps (T): 31 C/6 Tweed
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Kilpatrick Mine

FLUORITE, CALCITE, TOURMALINE, PYRITE, SPHALERITE, HEMATITE

In vein in marble

Colourless fluorite occurs with light brown tourmaline in white calcite. Pyrite, sphalerite and hematite are present in small amounts.

The deposit was a recent (1943) discovery. It was opened in 1944 by Detomac Mines Limited and was operated between 1953 and 1959 by Huntingdon Fluorspar Mines Limited. The mine consists of two shafts 24 m and 39.5 m deep; it was closed due to water in the openings. The shafts have been fenced off and filled; there are dumps nearby.

Road log from Highway 62 South at km 1.6 (see page 93):

km		
	0.0	Turn right onto Seymour Street.
	1.4	Junction single-lane road to Colquohuon Park Camping site; turn left.
	2.2	Mine.

Ref.: 29 pp. 37-38

Maps (T): 31 C/6 Tweed
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile).

Bailey Mine

FLUORITE, BARITE, CALCITE, MARCASITE, TETRAHEDRITE

In vein in marble

Light green, yellow, and reddish fluorite occurs with colourless platy and white fibrous barite in calcite which fluoresces bright pink under 'short' ultraviolet rays. During mining operations white and pale blue tabular crystals of barite were found. Marcasite and tetrahedrite were also reported from the deposit.

This fluorite deposit was discovered in the 1890s by Nicholas Fleming while excavating a cellar. In 1905 mining operations were commenced by Stephen Wellington and a shaft was sunk. This was the first fluorite mine to operate in the Madoc area. The mine was worked again in 1907, from 1916 to 1917, and from 1944 to 1950. The last operations were by Milwood Fluorspar Mines Limited which operated a 58 m shaft (now fenced off). About 22 675 t of fluorite were produced making this the second largest Madoc producer after the Rogers Mine. There are small dumps nearby. The mine is on the property of Mr. Lebeau.

Road log from Highway 62 South at km 1.6 (see page 93):

km		
	0.0	Turn right onto Seymour Street.
	1.9	Lebeau farmhouse on right.
	2.0	Bailey Mine on right.

Refs.: 29 pp. 27-28; 92 pp. 66-67

Maps (T): 31 C/6 Tweed
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Keen Mine

FLUORITE, BARITE, CELESTINE

In calcite vein in marble and diorite

Colourless, yellow, green and rose-red fluorite occurs with white tabular barite and grey celestine. Transparent, colourless, optical grade crystals of fluorite measuring 10 to 12 cm in diameter were obtained from the deposit during mining operations; it was associated with masses of fibrous celestine.

The fluorite-bearing vein was discovered in 1917 by the owner of the property, Mr. Keen, while enlarging the opening of a natural spring. In the following year, Mr. Rinaldo McConnell opened the deposit by a pit, 3 m deep. From then until 1919, it was worked by Canadian Fluorite, Limited by a vertical shaft. It was worked again in 1943 by H.C. Miller, and between 1944 and 1950 by Millwood Fluorspar Mines Limited. The shaft is 27.7 m deep; an inclined raise from the 17.4 m level reaches the surface at a point about 120 m north of the shaft. Total production of fluorite amounted to about 4535 t.

The mine is located on the Keen farm, opposite the Bailey Mine.

Refs.: 29 p. 35-39; 92 p. 64-66

Maps (T): 31 C/6 Tweed
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

McIlroy Mine

FLUORITE, BARITE, CALCITE

In vein in marble

Colourless to yellow fluorite occurs with small amounts of barite in white and pink calcite that fluoresces bright pink under 'short' ultraviolet rays. A few grains of pyrite were noted in the calcite.

Fluorite was mined here by C.R. Ross between 1916 and 1923. A 23.8 m shaft and an open cut were used. In 1944 Detomac Mines Limited deepened the shaft to 37 m and produced 127 t of fluorite. The openings have been filled in and there are small dumps near them.

Road log from Highway 62 South at km 1.6 (see page 93):

km		
	0.0	Turn right onto Seymour Street.
	2.2	Junction; turn right onto the old Marmora Road.
	3.0	Junction; turn right onto single-lane road.
	3.8	End of road. Trail on right leads 90 m to the mine.

Refs.: 29 pp. 40-41; 92 pp. 68-69

Maps (T): 31 C/5 Campbellford
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Wallbridge Mine

FLUORITE, BARITE, CALCITE

In vein cutting grey Ordovician limestone

Colourless, light green and mauve fluorite occurs with white, pink and light brown platy barite in coarsely crystalline white calcite. The colourless fluorite fluoresces yellowish white and the calcite fluoresces bright pink when exposed to ultraviolet rays ('short' rays more effective than 'long').

The deposit was discovered in 1918 by G.M. Wallbridge. It was worked for fluorite from open cuts and two shafts (38 m and 15 m deep) first in 1920-22 and later (by Dominion Fluorspar Company Limited) in 1941-43. The Herrington fluorite mine adjoins this mine to the north (45 m) and the Lee Senior fluorite mine is about 275 m to the south. There is a large dump near the main shaft which has been fenced off.

Road log from Highway 62 South at km 1.6 (see page 93):

km		
	0.0	Proceed west along Seymour Street.
	2.2	Junction; turn right onto the old Marmora Road.
	6.6	Junction single-lane road; turn right.
	6.9	Mine on right.

Refs.: 29 pp. 50-53; 92 pp. 72-74

Maps (T): 31 C/5 Campbellford
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Stoklosar (Marmora Road) Quarries

MARBLE

Light green and white calcitic marble was formerly quarried here by Stoklosar Marble Quarries. Tremolite, serpentine and chlorite are responsible for the green colour of the rock. Other minerals present are: calcite (fluoresces pink under 'short' ultraviolet rays); pyrite, as cubes (5 mm across) and massive; magnetite; fluorite, as yellow patches; finely granular sphalerite, as irregular blotches in the marble.

The quarries were opened on a ridge overlooking the old Marmora Road.

Road log from Highway 62 South at km 1.6 (see page 93):

km		
	0.0	Proceed west along Seymour Street.
	2.2	Junction; turn right onto the old Marmora Road.
	7.1	Turn-off, on right, to quarry.
	7.25	Turn-off on right, to second quarry.

Ref.: 38 p. 50

Maps (T): 31 C/5 Campbellford

(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Perry Mine

FLUORITE, BARITE, CALCITE, CELESTINE, PYRITE

In vein cutting marble

Colourless and light green fluorite is associated with white barite in calcite. The colourless fluorite fluoresces light yellow and the calcite fluoresces bright pink under ultraviolet rays. Small amounts of celestine and pyrite were reported from the deposit.

The fluorite vein was first exposed during the construction of the Belleville-Madoc railway. Mining operations were conducted by Messrs. Cross and Wellington from 1915 until 1920, and by Reliance Fluorspar Mining Syndicate Limited from 1941 until 1943. Two shafts (59 and 45 m deep) were used. They have been fenced in and there are small dumps nearby.

Road log from Highway 62 South at km 3.6 (see page 93):

km		
	0.0	Turn right (west) onto single-lane road.
	0.3	Mine on left.

Refs.: 29 pp. 45-46; 92 pp. 59-63

Maps (T): 31 C/6 Tweed
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Coe Mine

FLUORITE, BARITE, CALCITE, PYRITE

In veins cutting pink to buff-coloured marble

Good specimens of colourless to light green and, less commonly, yellow and mauve fluorite can be found in the dumps of this mine. The colourless variety fluoresces pale yellow when exposed to ultraviolet rays. White barite, pink and white calcite and pyrite are associated with fluorite. The white calcite fluoresces bright pink under ultraviolet rays, 'short' rays producing the brightest fluorescence.

The deposit, on the north shore of Moira Lake, was worked by open pits (1941-42), and later by a 12 m shaft (1960-61) sunk by Huntingdon Fluorspar Mines Limited. There is a large dump at the water's edge near the shaft-house which still remains on the site.

Road log from Highway 62 South at km 3.6 (see page 93):

km		
	0.0	Turn right (west) onto single-lane road.
	0.3	Perry Mine on left.
	0.7	Junction road on right (leads 0.65 km to the Rogers Mine); continue straight ahead.
	1.0	Mine on left.

Ref.: 29 p. 30

Maps (T): 31 C/5 Tweed
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Perry Lake Mine

FLUORITE, BARITE, CALCITE, CELESTINE, PYRITE

In vein cutting grey marble

The fluorite varies from light green to colourless (fluoresces pale yellow under ultraviolet rays) and yellow; cubes averaging 1 cm across are common. Platy white barite, celestine and pyrite occur with the fluorite in white and pink calcite (fluoresces bright pink under 'short' ultraviolet rays).

The deposit was first worked between 1910 and 1917 by open cuts (largest measured 24 m by 1.5 m and 4 to 7 m deep) and a 10.5 m shaft near the shore of Moira Lake. A 52 m shaft was sunk by Reliance Fluorspar Mining Syndicate Limited (later known as Huntingdon Fluorspar Mines Limited) which operated the mine in 1952 and in 1960. The head-frame and large dumps remain at the site.

Plate XIV

Coe fluorite mine, 1968 (GSC photo 151293)

Road log from Highway 62 South at km 3.6 (see page 93):

km		
	0.0	Turn left (east) onto cottage road.
	0.15	Junction; continue straight ahead.
	0.3	Mine on right; the original openings were to the left.

Ref.: 29 pp. 46-47

Maps (T): 31 C/6 Tweed
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Blakely Mine

FLUORITE, BARITE, CELESTINE, CALCITE, SPHALERITE

In veins cutting Ordovician grey limestone

Yellow, colourless and green massive fluorite is associated with white barite, light blue transparent celestine and brown sphalerite in pink to white calcite. When exposed to ultraviolet rays, the colourless fluorite fluoresces bright pink (especially bright under 'short' rays).

The fluorite vein was discovered in 1916 by James O'Reilly. It was mined from open-cuts, adits and a 22.8 m shaft. Operators included Stephen Wellington (1918-20), Canada Fluorspar Company (1928), and C.A. Stoklosar (1941-47). The shaft is covered and there are small dumps near it.

The mine is located on the Leslie Blakely farm, north of the barn. From Highway 62 (south) at km 5.3 (see page 93) proceed west along a farm lane to the Leslie Blakely farmhouse. Obtain permission to visit the property.

Refs.: 29 pp. 29-30; 92 pp. 57-58

Maps (T): 31 C/6 Tweed
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Noyes Mine

FLUORITE, BARITE, CELESTINE, CALCITE

In veins cutting granite and grey limestone

Colourless, light green, yellow and mauve fluorite occurs with pink and white platy masses of barite and snow-white fibrous aggregates of celestine in white calcite (fluoresces bright pink under 'short' ultraviolet rays). The colourless fluorite fluoresces white when exposed to ultraviolet rays. The barite is more abundant at this mine than at most of the other fluorite mines in the area and good specimens can readily be found.

The deposit was discovered in 1916 by Donald Henderson. It was worked by Messrs. Wellington and Munro (1917-18) for fluorite and for barite. It was later worked for fluorite by Canadian Industrial Minerals Limited (1918-1920) and by Mr. R.T. Gilman (1941-43). The deposit yielded a total of 22 675 t of ore equalling the production at the Bailey Mine. Mining was originally from open-cuts and later from two shafts, 33.5 and 71.6 m deep. There are large dumps near the shafts (now fenced in).

Road log from Highway 62 South at km 6.2 (see page 93):

km		
	0.0	Turn left (east) onto Concession XII Road.

1.6 Gate on left. From the gate a partly overgrown road leads 275 m to the mine.

Refs.: 29 pp. 41-43; 92 pp. 50-57

Maps (T): 31 C/6 Tweed
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Howard (Hill) Mine

FLUORITE, BARITE, CALCITE

In veins cutting Ordovician limestone

Fluorite is colourless (fluoresces white under ultraviolet rays) and, less commonly, pale yellow and green. White and pink platy and massive barite, and white calcite (fluoresces bright pink under 'short' ultraviolet rays) occur with the fluorite. Crystals of fluorite averaging 5 mm across are common.

The fluorite deposit was discovered on the Howard farm by Stephen Wellington in 1917. It was mined by Wellington and Munro from 1918 until 1920, and by various companies between 1940 and 1944. The ore was obtained from several open-cuts and from a 18 m shaft.

Road log from Highway 62 South at km 6.2 (see page 93):

km 0.0 Turn left (east) onto Concession XII Road.

2.3 Junction single-lane road on right. Proceed along this road for 0.5 km to a clearing with a telephone pole in the middle. Walk to the left of the pole to the mine in a wooded area (about 25 m from the pole).

Refs.: 29 pp. 31-33; 92 pp. 49-50

Maps (T): 31 C/6 Tweed
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Crookston Quarry

FOSSILS, CALCITE

In limestone

Ordovician fossils (shells, crinoids) are abundant in dark grey Black River limestone that weathers to a light grey. White massive and crystalline calcite occurs in veins; it fluoresces bright pink under 'short' ultraviolet rays.

Limestone was quarried in Crookston between 1890 and 1927 for use as building stone, for monument bases and for bridge construction. The stone was used for piers for the Victoria and South Shore bridges in Montreal.

Road log from Highway 62 South at km 9.9 (see page 93):

km 0.0 Turn left (east) onto road to Crookston.

0.95 Quarry on left.

Refs.: 26 p. 94; 63 pp. 50-51

Maps (T): 31 C/6 Tweed

(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile).

This is the last occurrence described for the side trip along Highway 62 south of Madoc; the main log along Highway 7 is resumed.

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km 182.8 Junction Highway 62.

184.2 Junction road to O'Hara Mill Conservation area.

Madoc Marble Quarry

MARBLE

Scalenohedrons of white calcite occur in reddish brown to greyish marble. The calcite is weakly fluorescent (pink) under ultraviolet rays. Some of the marble is banded.

The quarry measuring 6 m by 9 m was formerly operated at the side of a road by Madoc Marble Quarries.

Road log from Highway 7 at **km 184.2:**

km		
	0.0	Turn right (north) onto road to the O'Hara Mill Conservation area.
	1.9	Junction; continue straight ahead.
	4.7	Junction; turn left.
	5.2	Marble quarry at bend on right.

Ref.: 38 p. 36

Maps (T): 31 C/12 Bannockburn
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Seymour Mine

MAGNETITE, CHLORITE, ACTINOLITE, CALCITE, URACONITE

In rhyolite and amphibolite

Finely granular magnetite occurs with chlorite, actinolite and calcite in volcanic rocks. Uraconite has been reported from the deposit.

The mine is an open pit measuring 61 m by 6 m with a 38 m shaft at the bottom of it. It was operated from 1837 until 1845. There is a large dump near the pit.

Raod log from Highway 7 at **km 184.2:**

km		
	0.0	Turn right onto road to the O'Hara Mill Conservation area.
	4.7	Junction; continue straight ahead.
	5.4	Mine on right, approximately 65 m from the road.

Refs.: 41 p. 22; 66 p. 53

Maps (T): 31 C/12 Bannockburn
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

km 188.2 Junction road on right.

Freeman Quarry

BARITE, CALCITE

In marble

Platy aggregates of white barite are associated with white and pink calcite in reddish to brownish grey finely banded crystalline limestone (marble). The reddish colour is due to fine inclusions of hematite.

The quarry, on the Freeman farm, was formerly operated by Stoklosar Marble Quarries.

Road log from Highway 7 at **km 188.2**:

km		
	0.0	Turn right (north) onto gravel road.
	1.4	Junction; turn left.
	5.5	Stan Freeman farmhouse; road continues straight ahead to quarry.
	5.8	Quarry.

Ref.: 38 pp. 33-34

Maps (T): 31 C/12 Bannockburn
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch to 1/2 mile)

Dominion Mine

MAGNETITE, PYRITE, EPIDOTE, CALCITE, HEMATITE, MARTITE, SMALTITE, ERYTHRITE

In trap rock, slate, and altered crystalline limestone

Magnetite occurs as bands, as disseminated grains and as veinlets in the rock. Epidote is common as granular streaks associated with calcite and pyrite. Hematite and martite, alteration products of magnetite, occur sparingly. Smaltite has been reported to occur in magnetite, and erythrite as a coating on the magnetite.

The deposit was worked for iron many years ago from an open-cut measuring 38 m by 5.5 m. The opening was made into the side of a wooded ridge.

Access is by a single-lane, dry-weather road that leads south from Highway 7 at **km 188.2**. Proceed 0.6 km on this road to a power line; bear left and proceed 45 m across the meadow to the mine on the wooded slope.

Ref.: 66 pp. 17-18

Maps (T): 31 C/5 Campbellford
(G): 2154 Madoc Township and part of Huntingdon Township (O.G.S., 1 inch toe 1/2 mile)

km 189.0 Trench on right side of highway. Fluorite, as colourless cubes and in massive form, occurs with white platy barite and with pyrite in white massive calcite (fluoresces bright pink under 'short' ultraviolet rays). The fluorite-bearing veins cut grey Ordovician limestone.

189.2 Junction single-lane road on left. This road leads 1.6 km to the Wallbridge fluorite mine (see page 97):

189.5 Road-cuts expose fossils (shells, crinoids) in Black River limestone (Ordovician).

193.9 Junction on left, road to Ackerman Mine.

Ackerman Mine

ARSENOPYRITE, ILMENITE, PYRITE, TOURMALINE, CALCITE, DOLOMITE

In quartz-feldspar veins cutting granite

Arsenopyrite occurs as slender striated prisms measuring up to 2 cm long. Ilmenite, as lustrous black flat crystals (about 1 cm across), is associated with the arsenopyrite. Other minerals present include pyrite, black tourmaline, and carbonates.

The deposit was opened by a shaft for gold. Numerous similar gold-bearing arsenopyrite veins were opened in the Deloro-Marmora area between about 1870 and 1900. The shaft is fenced off and there is a fairly large dump nearby. Good specimens of arsenopyrite are avilable.

Access is via a single-lane road leading south 90 m from Highway 7 at **km 193.9** (see page 103).

Ref.: 44 p. 104

Maps (T): 31 C/12 Bannockburn
(G): 26-1963 Bannockburn, Ontario (GSC)

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km 194.4 Bridge over Moira River.

194.8 Road-cuts expose greyish green tremolite-bearing marble.

195.3 Junction road to Deloro and Hastings Road 11.

Marmora Road Quarries

MARBLE

White and greyish green marble was formerly quarried along the old Marmora Road by Stoklosar Marble Quarries for use in manufacturing terrazzo chips. The marble contains colourless and light green tremolite which is responsible for its green colour. Pyrite, pyrrhotite, magnetite, chlorite, tourmaline and serpentine occur in the marble.

Road log from Highway 7 at **km 195.3**:

km 0.0 Turn left (south) onto Hastings Road 11.

0.6 Junction; turn left.

1.7 Quarries on left.
1.9

Ref.: 38 p. 29

Maps (T): 31 C/5 Campbellford
(G): 54-17 Campbellford, Hastings, Northumberland and Peterborough counties (GSC)

Deloro Gold Mine

ARSENOPYRITE, GOLD, ANKERITE, PYRITE, CHALCOPYRITE, MICA, FLUORITE, ZIRCON, HEMATITE, ARSENOLITE

In quartz veins cutting shear zones in igneous rocks

The ore consisted of arsenopyrite and native gold. The arsenopyrite occurs as slender prismatic crystals; native gold was found as tiny grains intimately associated with the arsenopyrite, and as large grains and scales in quartz. Ankerite, pyrite, chalcopyrite, and mica are associated with the ore minerals. Other minerals reported from the deposit are fluorite, zircon (rare), hematite, and arsenolite.

The mine was worked intermittently by various companies between about 1870 and 1903. It was worked by underground methods. A mill for recovering arsenic and gold was built at Deloro. More than 1800 t of arsenic were produced and close to $200,000 worth of gold was recovered. After the mine closed in 1903, the Deloro Mining and Reduction Company converted the mill into a refinery for treating cobalt-nickel-arsenide ores from Cobalt.

Road log from Highway 7 at **km 195.3** (see page 104):

km		
	0.0	Turn right (north) onto road to Deloro.
	1.1	Junction at Deloro post office (the former refinery is straight ahead); turn left onto road to Malone.
	2.9	Trail on right leads 450 m to the mine. Permission to visit this mine may be obtained from the farmhouse on the left side of the road 0.3 km north of its junction with the trail.

Refs.: 18 p. 17; 44 pp. 101-103; 57 pp. 195-196

Maps (T): 31 C/12 Bannockburn
(G): 26-1963 Bannockburn (GSC)

McCann Quarry

MARBLE

Greyish green marble was formerly quarried on this property by Hastings Marble Products Limited. Some of the marble is banded with green, the colour being due to tremolite, chlorite and serpentine. Pyrite and magnetite occur in the marble.

The quarry is situated on the farm of Mr. Grant McCann near Malone village.

Road log from Highway 7 at **km 195.3** (see page 104):

km		
	0.0	Turn right (north) onto road to Deloro.
	2.1	Deloro; turn left at post office onto road to Malone.
	2.9	Trail on right to Deloro gold mine; continue straight ahead.
	8.8	Turn-off (left) to the McCann farm. The quarry is behind the barn and about 200 m west of the main road to Malone.

Ref.: 38 p. 30

Maps (T): 31 C/12 Bannockburn
(G): 29-1963 Bannockburn (GSC)

Malone Quarries

MARBLE

White to grey crystalline limestone is exposed by six small quarries east of Malone village. Magnetite and hematite occur as small grains and patches in the marble. Slender crystals of amphibole (measuring about 2 cm long and 2 mm wide) and olive-green pyroxene (crystals and massive) are found in calcite.

The quarries were formerly operated by W.F. Bonter and Company for use in pulp and paper mills, for terrazzo chips, and for poultry grit. A crushing plant was operated by the company at the site. The quarries are now waterfilled.

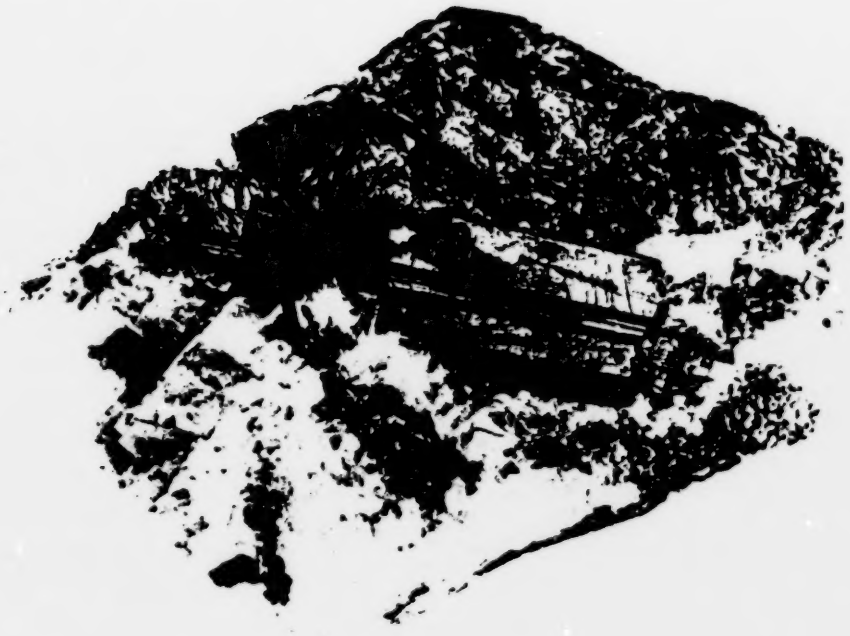

Plate XV

Epidote crystal with calcite and pyrrhotite, Marmoraton Mine. (Actual size of crystal is 5 cm) (GSC photo 201184-E)

Road log from Highway 7 at **km 195.3** (see page 104):

km		
	0.0	Turn right (north) onto road to Deloro and follow road log to the McCann quarry.
	8.8	Turn-off to McCann farm; continue straight ahead.
	9.0	Malone; turn right at general store.
	9.3	Gate to quarries. Obtain permission from Mr. R. Pinchin (house on left) to visit quarries. The first quarry is about 0.5 km beyond the gate.

Ref.: 38 pp. 31-33

Maps (T): 31 C/12 Bannockburn
(G): 26-1963 Bannockburn (GSC)

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km 198.4 Turn-off (left) to the Marmoraton Mine.

Marmoraton Mine

MAGNETITE, EPIDOTE, GARNET, PYROXENE, CALCITE, ACTINOLITE, PYRITE, PYRRHOTITE, CHALCOPYRITE, MARCASITE, HEMATITE, GOETHITE, CHLORITE, TITANITE

In skarn zone between igneous and metasedimentary rocks

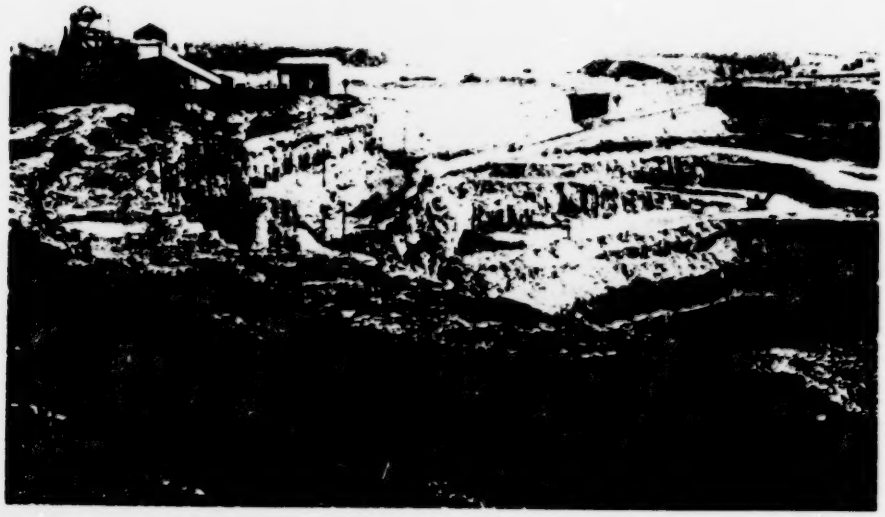

Plate XVI

Open-pit operations, Marmoraton Mine. (GSC photo 151288)

Massive magnetite is the ore mineral. Associated with it are doubly terminated prismatic crystals of dark green epidote measuring about 1 cm across and 5 to 8 cm long. The epidote generally occurs with brownish red massive garnet, dark green pyroxene, white calcite, and green fibrous actinolite. Other minerals associated with the magnetite are pyrite, pyrrhotite, chalcopyrite, marcasite, hematite, goethite, chlorite and titanite.

The deposit was discovered in 1949 by geophysical methods employed by geologists of the Geological Survey of Canada and the Ontario Department of Mines. Preparations for open-pit mining began in 1952 by Bethlehem Mines Corporation. About 38 m of overburden consisting of limestone and glacial drift had to be removed prior to mining the ore. The first ore concentrate was shipped in 1955. The magnetite ore averaged 37 per cent iron. The mine was operated by Marmoraton Mining Company Limited until 1978.

Road log from Highway 7 at **km 198.4** (see page 106):

km		
	0.0	Turn left (south) onto mine road.
	0.8	Visitors Look-out on right; the open-pit can be viewed from this point.
	1.1	Mine.

Ref.: 66 pp. 44-46

Maps (T): 31 C/5 Campbellford
(G): 54-17 Campbellford, Hastings, Northumberland and Peterborough counties (GSC)

km 200.0 Marmora, at junction Highway 14 and junction road to Cordova and Belmont mines.

Cordova Mine

GOLD, PYRITE, PYRRHOTITE, CHALCOPYRITE, MAGNETITE, CHLORITE, MICA, HORNBLENDE, EPIDOTE, SERPENTINE, APATITE

In quartz-carbonate veins cutting diorite

Quartz containing native gold was found at this mine during its early years of operation. In more recent operations gold was obtained from pyrite. Minerals associated with pyrite in the veins are pyrrhotite, chalcopyrite, magnetite, chlorite, mica, hornblende, epidote, serpentine and apatite.

Gold was discovered at this locality in 1890 by Mr. H.T. Strickland of Peterborough who noticed the free gold in a vein near the road while watering his horse. Assays of the samples confirmed his earlier identification. Operations were started in 1891 with the sinking of a shaft by Messrs. Strickland, Carscallen, O'Neill and Burnham. A mill was installed in 1892 by Mr. Middleton Crawford who leased the property and extracted $5,000 worth of gold in a year. The mine was again worked during short intervals by various operators until 1939-40 when the Consolidated Mining and Smelting Company of Canada, Limited operated the mine. The ore was obtained from a 122 m and a 56 m shaft, and from a 320 m inclined shaft. Another mill was installed in 1939. The mine yielded a total of 708 kg of gold and 21 368 g of silver. There are large dumps at the mine, which is also known as the Belmont gold mine.

Road log from Highway 7 at **km 200.0** in Marmora:

km	0.0	Turn right (north) onto road to Cordova Mines (McGill Street).
	0.6	Fork; bear left.
	0.8	Junction Main Street; continue straight ahead.
	7.1	Junction; bear left to Cordova Mines.
	12.7	Cordova Mines at junction single-lane road on left; turn left.
	12.9	Mine on left.

Refs.: 7 pp. 47-51; 57 pp. 188-192; 72 pp. 36-40

Maps (T): 31 C/12 Bannockburn
(G): 26-1963 Bannockburn (GSC)

Belmont (Ledyard) Mine

MAGNETITE, PYRITE, PYRRHOTITE, CHALCOPYRITE, HEMATITE, GARNET, EPIDOTE, HORNBLENDE, VESUVIANITE

At contact gabbro and crystalline limestone

Coarsely granular magnetite occurs with pyrite and with small amounts of pyrrhotite, chalcopyrite and hematite. Minerals that commonly occur in the crystalline limestone are dark brown garnet, epidote, dark green hornblende and bottle-green vitreous vesuvianite.

The mine was originally worked from open-cuts before the turn of the century. The Canadian Furnace Company Limited operated the mine from 1911 until 1914 from a 79 m shaft. The mine was formerly known as the Ledyard Mine.

Road log from Highway 7 at Marmora **(km 200.0)**:

km	0.0	Proceed north along McGill Street and follow road log to the Cordova Mine.

12.7 Turn-off to Cordova Mine; continue along main road.

12.9 Cordova Mine at junction road on right; bear left.

13.7 Junction; turn left.

13.8 Fork; bear left.

14.5 Junction partly overgrown trail on left. This trail leads 185 m to the mine.

Refs.: 66 pp. 18-20; 68 p. 108; 72 p. 48

Maps (T): 31 C/12 Bannockburn
(G): 29-1963 Bannockburn (GSC)

Armstrong Brothers (Marmora) Quarry

EPIDOTE, GARNET, ACTINOLITE, HORNBLENDE, PYRITE, MAGNETITE

In basalt

Epidote occurs as granular masses and as dark green prismatic crystals commonly 2 cm long. It is generally associated with white to colourless calcite; specimens of epidote in pink feldspar were also found. Associated with epidote are actinolite, hornblende, pyrite and magnetite.

Fossiliferous Black River limestone is also found on this property. Both the basalt and the limestone are dump material from the Marmoraton Mine located just north of the Armstrong Brothers property.

Road log from Highway 7 at Marmora (**km 200.0**, see page 108):

km 0.0 Proceed south along Highway 14.

2.6 Abandoned limestone quarry on right. There are a few Ordovician fossils in the rock.

3.2 Junction road to Armstrong Brothers Marmora quarry; turn left.

4.8 Armstrong Brothers office.

Maps (T): 31 C/5 Campbellford
(G): 54-17 Campbellford, Hastings, Northumberland, and Peterborough counties (GSC)

Highway 14 Quarry

FOSSILS

In limestone

Shell fossils are abundant in Trenton limestone (Ordovician) exposed in this abandoned quarry.

Road log from Highway 7 at Marmora (**km 200.0**, see page 108):

km 0.0 Proceed south along Highway 14.

3.2 Turn-off to Armstrong Brothers property, continue along highway.

13.4 Quarry on right.

Maps (T): 31 C/5 Campbellford

(G): 54-17 Campbellford, Hastings, Northumberland, and Peterborough counties (GSC)

The main road log along Highway 7 is now resumed.

km		
	200.3 to 201.0	**Road-cuts expose Black River (Ordovician) limestone. Chert and fossil corals occur in the rock.**
	204.5	**Road-cuts expose basalt cut by veinlets of epidote.**
	205.1	**Junction Bayview Park Road.**
	206.6	**Junction Blairton Road.**

Blairton Mine

MAGNETITE, HEMATITE, PYRITE, MARTITE, EPIDOTE, ACTINOLITE, GARNET, SERPENTINE, TOURMALINE, CALCITE

In skarn and metamorphic pyroxenite

The ore mineral at this mine is magnetite. It is finely granular, massive, and has small amounts of hematite, pyrite and martite associated with it. Epidote, actinolite, garnet (brown), serpentine and tourmaline occur in massive calcite veins cutting the magnetite. The rocks in the vicinity of the orebody consist of gabbro, crystalline limestone and chlorite schist; magnetite and red hematite also occur in the gabbro and the limestone.

The mine was operated intermittently from 1820 until 1875 and was the first iron mine opened in the province. In the early days the ore was transported via Crow Lake to furnaces in Marmora. This did not prove to be successful and the mine was closed shortly after its opening. It was worked again from 1867 until 1875. Approximately 272 100 t of magnetite were mined making this one of the largest producers in eastern Ontario. The ore was obtained from three open pits (largest measures 46 by 61 m and 38 m deep) near the south shore of Crow Lake. There are large dumps near the pits.

Road log from Highway 7 at **km 206.6**:

km		
	0.0	Turn right (north) onto the Blairton Road.
	0.9	Junction; turn right.
	1.0	Fork; bear left.
	1.4	Mine. The first pits are on the left. Continue 0.3 km to other pit at end of road.

Refs.: 51 pp. 9-10; 66 pp. 22-25; 72 pp. 47-48

Maps (T): 31 C/5 Campbellford
(G): 54-17 Campbellford, Hastings, Northumberland, and Peterborough counties (GSC)

km		
	212.4	**Junction on right, road to Minnesota Minerals quarry.**

Minnesota Minerals Quarry

EPIDOTE, CHLORITE, HEMATITE, QUARTZ

In basalt

Epidote is common as fibrous and prismatic aggregates and in massive form. It is associated with white massive calcite and small amounts of dark green chlorite.

Hematite occurs on the chlorite as an alteration product. Quartz is common in the rock. Black River limestone containing some shell fossils is exposed by an old quarry near the mine office.

The basalt quarry and a crushing plant are operated by Minnesota Minerals Limited for use as roofing material. Casual visitors are not admitted to the quarry.

Access to the property is by a road 0.6 km long leading north from Highway 7 at km 212.4.

Ref.: 72 pp. 90-91

Maps (T): 31 C/5 Campbellford
(G): 54-17 Campbellford, Hastings, Northumberland and Peterborough counties (GSC)

---

km 218.0 Havelock, at Junction Highway 30 and road to Blue Mountain quarry.

Campbellford Quarry

FOSSILS

In limestone

Fossiliferous Trenton limestone and shale of Ordovician age is exposed in a quarry south of Campbellford. The quarry is water-filled but specimens can be obtained from broken blocks of rock around it. Fossils include bryozoans brachiopods and trilobites.

Road log from Highway 7 at Havelock (km 218.0):

km 0.0 Proceed soth along Highway 30.

18.0 Campbellford at turn in front of bridge; proceed toward Brighton.

22.2 Quarry on left.

Ref.: 93 p. 9

Maps (T): 31 C/5 Campbellford
(G): 54-17 Campbellford, Hastings, Northumberland and Peterborough counties (GSC)

Blue Mountain Quarry

CANCRINITE, NEPHELINE, FELDSPAR, MICA, CHLORITE, MAGNETITE

In nepheline syenite

Pale yellow and pink translucent cancrinite occurs in coarse nepheline syenite. It is suitable for lapidary purposes. The syenite rock is composed mainly of feldspar (microcline and plagioclase) and white to grey nepheline, which is distinguished from the feldspar by its greasy appearance. Accessory minerals include biotite, muscovite, chlorite, magnetite, pyroxene and amphibole.

The deposit is operated for nepheline by International Minerals and Chemical Corporation. The quarry and mill began operations in 1956.

Road log Highway 7 at Havelock (km 218.0):

km 0.0 At junction Highway 30 in Havelock, turn right (north) onto Peterborough County Road 48.

4.2 Junction; turn right.

18.5 Road-cuts, both sides, expose dolomitic marble containing abundant radiating aggregates of silky white and, less commonly, grey and light green tremolite; rosette-shaped aggregates are common. The marble is white to sand-coloured, pink, grey and brownish; dolomite-rich masses have a sugary texture. Black tourmaline, brown mica, pyrite, calcite and quartz are present in small quantities in the marble.

18.8 Road-cuts expose tremolite-bearing marble.

18.8 Gate on left and trail leading 180 m to a small quarry where white and pinkish marble was formerly quarried. Property belongs to Mr. Norris Whitney.

19.0 Norris Whitney farmhouse on right. Obtain permission to visit Whitney quarry.

19.6 to 23.3 Road-cuts expose Ordovician limestone containing black chert nodules and lenses (2 to 8 cm across), and fossils (shells, crinoids).

27.5 Road-cuts expose amphibolite with abundant epidote and some garnet, pyrite, titanite and feldspar.

28.5 Fork; bear left.

32.5 Fork; bear right.

34.7 Mine.

Refs.: 35 pp. 1-30, 134-142; 72 p. 78

Maps (T): 31 C/12 Bannockburn
(G): 1960e Methuen Township, County of Peterborough (O.G.S., 1 inch to 1/2 mile)

---

km 227.2 Norwood at junction Victoria Street and road to Crow's Landing and to Nephton quarry (this junction is 0.15 km east of the junction of Highways 7 and 30 in Norwood).

Nephton Quarry

NEPHELINE, FELDSPAR, MICA, CHLORITE, CANCRINITE, MAGNETITE, GARNET, SODALITE, THOMSONITE, PREHNITE, ANALCIME, CORUNDUM

In nepheline syenite

The nepheline syenite is composed of nepheline, feldspar (plagioclase and microcline), mica and chlorite, and is similar to the deposit at the Blue Mountain quarry. Other minerals present are: pink and yellow cancrinite, magnetite, garnet, sodalite and thomsonite. Crystals of prehnite and analcime have been reported to occur in vugs in the syenite. Bluish grey corundum, partly altered to mica, occur in coarse nepheline syenite exposed by old pits in the vicinity of the quarry. The cancrinite is suitable for lapidary purposes but the sodalite occurs only as irregular patches not generally large enough for these purposes.

The deposit was first prospected for corundum between 1897 and 1905. In the 1930s interest was renewed in the deposit because of the nepheline which became a source of raw material for the manufacture of ceramics. Open-pit operations have been continuous since 1935 and from 1946 until 1948 underground operations were also used. A mill was erected on the site in 1956. The operator of the quarry and mill is Industrial Minerals of Canada Limited.

Road log from Highway 7 at Norwood (km 227.2):

km 0.0 Turn right (north) onto Victoria Street (Peterborough County 40 Road).

Plate XVII

Nephton nepheline quarry (GSC photo 151281)

20.9 Junction; turn right onto road to Nephton.

26.1 Blocks of red granite are exposed along the road.

31.0 Turnoff (left) to Indian petroglyths (carvings on marble).

32.3 Nephton; bear left at fork.

33.0 Mine office on left. Old quarries are located on the ridge above the office. The main quarry (Cabin Ridge) is located 1.6 km east of the office.

Refs.: 35 pp. 1-30, 134-142; 72 p. 78

Maps (T): 31 D/9 Burleigh Falls
31 C/12 Bannockburn

(G): 1960e Methuen Township, County of Peterborough (O.G.S., 1 inch to 1/2 mile)

km 237.2 Junction road to Warsaw.

Warsaw Caves

Black River limestone (Ordovician) is exposed in the Warsaw Caves Conservation Area. A subterranean stream has eroded the limestone and produced a series of caves in a wooded area.

Road log from Highway 7 at **km 237.2:**

km		
	0.0	Turn right onto road to Warsaw.
	7.2	Warsaw at junction; proceed straight ahead through the village.
	10.8	Junction; turn right.
	11.7	Entrance to Conservation area.

Maps (T): 31 D/8 Peterborough
(G): 53-27B Peterborough. Peterborough, Victoria, Durham and Northumberland counties (GSC)

km 246.7 Junction road to Serpent Mounds Provincial Park.

256.8 Peterborough, at Lansdowne Street and George Street.

Lakefield Quarry

FOSSILS

In limestone

Fossils including bryozoans and brachiopods are abundant in dark grey Trenton limestone (Ordovician). Shale is interbeddd with the limestone.

The quarry was formerly operated by the Canada Cement Company. A cement plant near the quarry was also operated by the company.

Road log from Peterborough **(km 256.8):**

km		
	0.0	Turn right (north) onto George Street.
	2.4	Junction highways 7B and 28B; proceed along Highway 28B (Water Street).
	3.2	Junction; proceed along Highway 28.
	12.7	Junction Highway 507 North; continue along Highway 28.
	16.4	Lakefield, at bridge.
	19.5	Junction; turn right leaving Highway 28.
	21.7	Junction; turn right onto quarry road.
	21.9	Quarry.

Refs.: 26 p. 148; 34 pp. 44-45

Maps (T): 31 D/8 Peterborough
(G): 53-27B Peterborough. Peterborough, Victoria, Durham, and Northumberland counties (GSC)

Nogies Creek Quarry

ANHYDRITE

In limestone

Greenish grey and reddish limestone was formerly quarried from this deposit by Black River Limestone Products. Finely crystalline aggregates of pinkish white anhydrite occur in cavities up to 5 cm across in the limestone.

Road log from Peterborough at **km 256.8** (see page 114):

km		
	0.0	Proceed north along George Street and follow log toward Lakefield quarry.
	12.7	Junction; turn left onto Highway 507.
	40.1	Junction; turn left onto Highway 36.
	48.1	Junction; turn left onto Tate's Bay Road (Quarry Road).
	49.2	Fork; bear right.
	49.7	Entrance to quarry on right.

Ref.: 37 p. 29

Maps (T): 31 D/9 Burleigh Falls
(G): 52a Haliburton area (O.G.S., 1 inch to 2 miles)

Briar Court Mines Property

THORITE, ALLANITE, MAGNETITE

In granite

Radioactive minerals including thorite and allanite occur with magnetite in coarse red granite. The thorite occurs as greenish black laths, the allanite as lustrous black patches.

The deposit was stripped in 1968 by Briar Court Mines Limited.

Road log from Peterborough at **km 256.8** (see page 114):

km		
	0.0	Proceed north along George Street and follow log toward Nogies Creek quarry.
	40.1	Junction Highway 36; continue along Highway 507.
	58.2	Junction Baldwin Bay Road; continue straight ahead.
	60.2	Junction mine road; turn left.
	60.5	Stripped area.

Maps (T): 31 D/16 Gooderham
(G): 1957-b Haliburton-Bancroft area (O.G.S., 1 inch to 2 miles)

Coboconk Quarries

FOSSILS

In limestone

Black River limestone (Ordovician) occurs in two quarries in Coboconk village. Crinoids, brachiopods and fossil corals occur in the rock. Lithographic limestone is also present. The quarries were operated for the production of lime.

The quarries are located on both sides of Highway 35 in Coboconk. The quarry on the west side was formerly operated by the Toronto Brick Company, the one to the northeast by Indusmin.

Road log from Peterborough at **km 256.8** (see page 114):

km		
	0.0	Proceed north along George Street and follow log toward turn-off to Nogies Creek quarry.
	48.1	Junction Tate's Bay Road; continue straight ahead.
	56.1	Bobcaygeon; at junction Highway 649; continue straight ahead.
	56.9	Junction; proceed to Fenelon Falls.
	72.9	Junction; turn left onto Highway 121.
	74.8	Fenelon Falls, at junction Highway 35 A; turn right.
	78.3	Junction Highway 35; turn right.
	94.4	Coboconk, at turn-off to Toronto Brick quarry on left; to reach other quarry, continue straight ahead.
	94.8	Coboconk at junction Baseline Road; turn right.
	94.9	Fork; bear right.
	95.0	Indusmin quarry.

Refs.: 26 pp. 198-201; 34 pp. 42-44

Maps (T): 31 D/10 Fenelon Falls
(G): 52-31A Fenelon Falls, Victoria, Peterborough and Haliburton counties (GSC)

Kirkfield Quarry

FOSSILS

In limestone

Ordovician fossils are abundant in grey to brownish grey Trenton limestone. Brachiopods, crinoids and small hat-shaped bryozoans have been reported.

The quarry, now water-filled, was formerly operated by Kirkfield Crushed Stone Limited for the production of crushed stone, agricultural limestone and asphalt filler. The quarry is located near Kirkfield village.

Road log from Coboconk at km 94.8 (see preceding log):

km		
	0.0	From intersection Highway 35 and Baseline Road, continue north along Highway 35.
	0.8	Junction; turn left onto Highway 46.
	7.7	Junction road to Balsam Lake Provincial Park; continue straight ahead.
	15.3	Junction Highway 505 to Victoria Road. A peat bog on the west side of Highway 505 at a point 1.7 km north of this junction was operated in the early 1940s. To reach quarry; continue along Highway 46.
	17.2	Junction; turn left onto gravel road.
	18.5	Junction quarry road; turn left.
	18.8	Quarry.

Refs.: 26 pp. 196-198; 34 pp. 40-42; 72 pp. 81-82

Maps (T): 31 D/10 Fenelon Falls
(G): 52-31 A Fenelon Falls, Victoria, Peterborough and Haliburton counties (GSC)

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GLOSSARY

Actinolite $Ca_2(Mg, Fe)_5Si_8O_{22}(OH)_2$. H = 5-6. Bright green to greyish green columnar, fibrous or radiating prismatic aggregates. Variety of amphibole.

Albite $NaAlSi_3O_8$. H = 6. Generally white tabular crystals or cleavable masses. Vitreous lustre. Variety of plagioclase feldspar. Used in manufacture of ceramics.

Allanite $(Ce,Ca,Y)_3(Al,Fe)_3(SiO_4)_3(OH)$. H = 6½. Black, less commonly, dark brown tabular aggregates, or masive with conchoidal fracture. Vitreous or pitchy lustre. Generally occurs in granitic rocks or in pegmatite and is commonly surrounded by an orange-coloured halo. Distinguished by its weak radioactivity.

Alunogen $Al_2(SO_4)_3 \cdot 17H_2O$. H = 1½-2. White fibrous crust; powdery. Vitreous to silky lustre. Acid, sharp taste. Secondary mineral associated with pyrite or marcasite.

Amazonite $KAlSi_3O_8$. H = 6. Apple green to bright green variety of microcline. Used for jewellery and ornamental purposes.

Amethyst SiO_2. H = 7. Mauve to purple variety of quartz.

Amphibole A mineral group consisting of complex silicates including tremolite, actinolite and hornblende. Common rock-forming mineral.

Amphibole-asbestos Fibrous variety of amphibole, e.g. tremolite, actinolite, anthophyllite and crocidolite. Used as an insulator, in fireproof paints and in filtrations.

Amphibolite A metamorphic rock composed essentially of amphibole and plagioclase feldspar.

Analcime $NaAlSi_2O_6 \cdot H_2O$. H = 5-5½. Colourless, white, yellowish or greenish, vitreous, transparent, trapezohedral crystals or massive. Distinguished from garnet by its inferior hardness. Often associated with other zeolites.

Anatase TiO_2. H = 5½-6. Yellowish or reddish brown pyramidal or tabular crystals with adamantine lustre; also grey or blue massive. Also known as octahedrite.

Anglesite $PbSO_4$. H = 2½-3. Colourless to white, greyish, yellowish or bluish tabular or prismatic crystals, or granular. Adamantine to resinous lustre. Characterized by high specific gravity (6.36 to 6.38) and adamantine lustre. Effervesces in nitric acid. Secondary mineral generally formed from galena. Ore of lead.

Anhydrite $CaSO_4$. H = 3½. White, bluish or greyish with vitreous lustre. Generally granular massive. Alters to gypsum by absorption of water. Distinguished from gypsum by its superior hardness. Used as a soil conditioner and for portland cement.

Ankerite $Ca(Fe,Mg,Mn)(CO_3)_2$. Variety of dolomite from which it cannot be distinguished in the hand specimen.

Apatite $Ca_5(PO_4)_3(F,Cl, OH)$. H = 5. Green to blue, colourless, brown, red, hexagonal crystals or granular, sugary massive. Vitreous lustre. May be fluorescent. Distinguished from beryl and quartz by its inferior hardness; massive variety distinguished from calcite and dolomite by lack of effervescence in HCl, and from diopside and olivine by its inferior hardness. Used in manufacture of fertilizers and in production of detergents.

Aragonite $CaCO_3$. H = 3½-4. Colourless to white or grey and less commonly, yellow, blue, green, violet, rose-red. As prismatic or acicular crystals; also columnar, globular, stalactitic aggregates. Vitreous lustre. Transparent to translucent. Distinguished from calcite by its cleavage and higher specific gravity (2.93). Effervesces in dilute HCl.

Arsenolite As_2O_3. H = 1½. White botryoidal, stalactitic, earthy encrustations. Vitreous to silky lustre. Sweetish astringent taste. Secondary mineral formed by oxidation of arsenopyrite, smaltite and other arsenic minerals.

Arsenopyrite FeAsS. H = 5½-6. Light to dark grey metallic striated prisms with characteristic wedge-shaped cross-section; also massive. Tarnishes to bronze colour. Ore of arsenic; may contain gold or silver.

Artinite $Mg_2(CO_3)(OH)_2 3H_2O$. H = 2½. White acicular crystals; fibrous aggregates forming botryoidal, spherical masses and cross-fibre veinlets. Transparent with vitreous, silky or satin lustre. Occurs in serpentine. Distinguished from calcite by its form and lustre.

Asbestos Fibrous variety of certain silicate minerals such as serpentine (chrysotile) and amphibole (anthophyllite, tremolite, actinolite, crocidolite) characterized by flexible, heat- and electrical-resistant fibres. Chrysotile is the only variety produced in Canada; it occurs as veins with fibres parallel (slip-fibre) or perpendicular (cross-fibre) to the vein walls. Used in manufacture of asbestos cement sheeting, shingles, roofing and floor tiles, millboard, thermal insulating paper, pipe-covering, clutch and brake components, reinforcing in plastics, etc.

Azurite $Cu_3(CO_3)_2(OH)_2$. H = 3½-4. Azure blue to inky blue tabular or prismatic crystals; also massive, earthy, stalactitic with radial or columnar structure. Vitreous, transparent. Secondary copper minerals. Effervesces in acids. Ore of copper.

Barite $BaSO_4$. H = 3-3½. White, pink, yellowish, blue, tabular or platy crystals; granular massive. Vitreous lustre. Characterized by a high specific gravity (4.5) and perfect cleavage. Used in the glass, paint, rubber, and chemical industries, and in oil-drilling technology.

Basalt Fine-grained igneous rock composed essentially of plagioclase feldspar, olivine and pyroxene.

Beta-uranophane $Ca(UO_2)_2Si_2O_7 \cdot 6H_2O$. H = 2½-3. Yellow to yellowish green aggregates of acicular crystals or short prismatic crystals. Silky to waxy. May fluoresce green in ultraviolet light. Secondary mineral occurring in granitic rocks and calcite veins containing uranium minerals.

Beyerite $Ca(BiO)_2(CO_3)_2$. H = 2-3. White, yellow, greenish yellow to green or grey platy, tabular crystals or earthy. Vitreous to dull lustre. Occurs as encrustations, or filling in cavities, fractures. Secondary mineral formed from bismuth minerals.

Biotite $K(Mg, Fe)_3(Al,Fe)Si_3O_{10}(OH,F)_2$. H = 2½-3. Dark brown, greenish black transparent hexagonal platy crystals, platy or scaly aggregates. Splendent lustre. Occurs in pegmatite.

Bismuth Bi. H = 2-2½. Light grey metallic reticulated crystal aggregates; also foliated or granular. Iridescent tarnish. Used as a component of low melting-point alloys and in medicinal and cosmetic preparations.

Bismuthinite Bi_2S_3. H = 2. Dark grey striated prismatic or acicular crystals; also massive. Iridescent on tarnished surface. Ore of bismuth.

Bismutite $Bi_2(CO_3)O_2$. H = 2½-3½. Yellowish white to brownish yellow, light green or grey earthy or pulverulent masses; also fibrous crusts, spheroidal aggregates, scaly or lammellar. Dull, vitreous or pearly lustre. Effervesces in HCl. Uncommon secondary mineral formed by alteration of bismuth minerals.

Bornite Cu_5FeS_4. H = 3. Reddish brown metallic. Usually massive and tarnished to iridescent blue, purple, etc. Known as peacock ore and variegated copper ore. Ore of copper.

Boulangerite $Pb_5Sb_4S_{11}$. H = 2½-3. Dark bluish grey, metallic, striated, elongated prismatic to acicular crystals; also fibrous, plumose aggregates. Fibrous cleavage is distinguishing characteristic. Ore of antimony.

Brucite $Mg(OH)_2$. H = 2½. White, grey, light blue or green tabular or platy aggregates; also foliated massive and fibrous. Pearly, waxy lustre. Soluble in HCl. Distinguished from gypsum and talc by its superior hardness and lack of greasy feel. Resembles asbestos but lacks silky lustre. Is more brittle than muscovite. Used for refractories and as a minor source of magnesium metal.

Cabochon A polished gemstone having a convex surface; translucent or opaque minerals such as opal, agate, jasper and jade are generally cut in this style.

Cancrinite $Na_6Ca_2Al_6Si_6O_{24}(CO_3)_2$. H = 6. Yellow, pink, grey, massive or prismatic crystals; vitreous to greasy lustre. Associated with nepheline and sodalite in nepheline syenite. Effervesces in warm HCl.

Caysichite $(Y,Ca)_4Si_4O_{10}(CO_3)_3 \cdot 4H_2O$. Colourless, white and less commonly yellow or green coatings or encrustations with divergent, columnar structure. Associated with other yttrium minerals. Originally described from the Evans-Lou Mine near Wakefield, Quebec. Name is for the elements: Ca, Y, Si, C, H.

Celestine $SrSO_4$. H = 3-3½. Transparent, colourless, white or pale blue tabular crystals; also fibrous massive. Vitreous lustre. Perfect cleavage. Resembles barite but is not as heavy. Ore of strontium.

Cenosite $Ca_2(Y,Ce)_2Si_4O_{12}(CO_3) \cdot H_2O$. H = 5-6. Yellowish brown, pink, short prismatic crystals. Vitreous lustre. Rare mineral not readily identifiable in hand specimen. Also known as kainosite.

Cerussite $PbCO_3$. H = 3-3½. Transparent white, grey or brownish tabular crystals with adamantine lustre; also massive. High specific gravity (6.5) and lustre are distinguishing features. Secondary mineral formed by oxidation of lead minerals. Fluoresces in shades of yellow in ultraviolet light. Ore of lead.

Chabazite $CaAl_2Si_4O_{12} \cdot 6H_2O$. H = 4. Colourless, white, yellowish or pinkish, square crystals. Vitreous lustre. Occurs in cavities in basalt. Distinguished from other zeolites by its almost cubic crystal form; distinguished from calcite by its superior hardness and its lack of effervescence in HCl.

Chalcedony SiO_2. H = 7. Translucent microcrystalline variety of quartz. Colourless, grey, bluish, yellow, brown, reddish. Formed from aqueous solutions. Attractively coloured chalcedony is used for ornamental objects and jewellery.

Chalcopyrite $CuFeS_2$. H = 3½-4. Brass yellow, massive. Iridescent tarnish. Brass colour is distinguishing feature. Also called copper pyrite. Ore of copper.

Chamosite Fe-rich chlorite. H = 3. Yellowish to dull green or grey earthy or clay-like masses. Occurs in some sedimentary iron deposits.

Chert Massive, opaque variety of chalcedony; generally drab-coloured (grey, greyish white, yellowish grey or brown).

Chlorite Hydrous silicate of Al, Fe, Mg. H = 2-2½. Transparent, green flaky aggregates. Distinguished from mica by its colour and by the fact that its flakes are not elastic.

Chondrodite $(Mg,Fe)_5(SiO_4)_2(F,OH)_2$. H = 6-6½. Orange-yellow grains and granular masses. Vitreous to slightly resinous lustre. Subconchoidal to uneven fracture. Occurs in crystalline limestone. Distinguished by its colour.

Chrysocolla $Cu_2H_2Si_2O_5(OH)_4$. H = 2-4. Blue to green, translucent to opaque, vitreous or waxy to earthy; compact fibrous or granular massive. Secondary mineral formed by oxidation of copper minerals.

Chinohumite $Mg_9Si_4O_{16}(F, OH)_2$. H = 6. Yellow to orange granular masses or nodules. Vitreous to resinous lustre. Occurs in crystalline limestone.

Copiapite $(Fe, Mg)Fe_4(SO_4)_6(OH)_2 \cdot 20H_2O$. H = 2½-3. Pale yellow to orange-yellow and greenish yellow granular or scaly aggregates; also tabular crystals. Transparent to translucent. Vitreous to pearly lustre. Secondary mineral formed from oxidation of sulphides, especially pyrite. Yellow colour is characteristic.

Coquimbite $Fe_2(SO_4)_3 \cdot 9H_2O$. H = 2½. White, yellowish, greenish, violet massive; also prismatic crystals. Vitreous lustre. Astringent taste. Secondary mineral formed from pyrite ore.

Corundum Al_2O_3. H = 9. Blue, red, yellow, brown hexagonal prisms, barrel-shaped, pyramidal, or flat tabular crystals. Uneven to conchoidal fracture. Adamantine to vitreous lustre. Distinguished by its hardness and characteristic barrel-shaped form. Red (ruby) and blue (sapphire) varieties used as a gemstone.

Diopside $CaMgSi_2O_6$. H = 6. Colourless, white to green monoclinic variety of pyroxene.

Diorite A dark coloured igneous rock composed mainly of plagioclase and amphibole or pyroxene.

Doverite See synchisite-Y.

Dyke A long narrow body of igneous rock that cuts other rocks.

Epidote $Ca_2(Al,Fe)_3(SiO_4)_3(OH)$. H = 6-7. Yellowish green massive fibrous aggregates. Vitreous lustre. Often associated with quartz and pink feldspar, producing attractive mottled or veined patterns. Takes good polish and can be used for jewellery and other ornamental objects.

Erythrite $Co_3(AsO_4)_2 \cdot 8H_2O$. H = 1½-2½. Rose-red to crimson globular, radial, reniform aggregates; also earthy or pulverulent; prismatic to acicular crystals (rare). Dull to adamantine lustre. Soluble in hydrochloric acid. Secondary mineral formed by oxidation with cobalt arsenides.

Eulytite $Bi_4(SiO_4)_3$. H = 4½. Yellow, grey, light green, brown, white, tetrahedral crystal aggregates, also spherical forms. Associated with bismuth minerals.

Euxenite $(Y, Ca, Ce, U, Th)(Nb, Ta, Ti)_2O_6$. H = 5½-6½. Black massive, or prismatic crystals forming parallel or radial groups. Brilliant, submetallic, or greasy lustre. Conchoidal fracture. Radioactive. Distinguished from other radioactive minerals by X-ray methods.

Feldspar A mineral group consisting of potassium aluminosilicates (orthoclase, microcline) and calcium silicates (plagioclase). Used in manufacture of ceramics, porcelain enamel, porcelain, scouring powders and artificial teeth.

Fergusonite (Y, Er, Ce, Fe)(Nb, Ta, Ti)O_4. H = 5½-6½. Black prismatic or pyramidal crystals; also massive. Brilliant to submetallic lustre on fresh surfaces. Alters to grey, yellowish or brownish on exposed surfaces. Subconchoidal fracture. Radioactive. Occurs in granite pegmatites. Distinguished from other radioactive minerals by X-ray methods.

Fluorescence Property of certain substances to glow when exposed to light from an ultraviolet lamp. It is caused by impurities in the substance or by defects in its crystal structure. Two wave lengths are commonly used to produce fluorescence: long wave (320 to 400 nm); short wave (2537 nm).

Fluorite CaF_2. H = 4. Transparent, colourless, blue, green, purple, yellowish, cubic crystals; also granular massive. Vitreous lustre. Good cleavage. Often fluorescent; this property derives its name from this mineral. Used in optics, steel making, ceramics.

Gabbro A dark coarse-grained igneous rock composed mainly of calcic plagioclase and pyroxene. Used as building and monument stone.

Garnet Silicate of Al, Mg, Fe, Mn, Ca. H = 6½-7½. Transparent red dodecahedral crystals or massive; also yellow, brown, green. Clear garnet is used as a gemstone. Also used as abrasive. Distinguished by its crystal form.

Gneiss A coarse-grained foliated metamorphic rock composed mainly of feldspar, quartz and mica. Used as building and monument stone.

Goethite FeO(OH). H = 5-5½. Dark brown to yellowish brown earthy, botryoidal, bladed or massive. Has characteristic yellowish brown streak. Weathering product of iron-rich minerals. Ore of iron.

Gold Au. H = 2½-3. Yellow metallic irregular masses, plates, scales, nuggets. Rarely as crystals. Distinguished from other yellow metallic minerals, by its softness, malleability, high specific gravity (19.3). Precious metal. Placer gold refers to gold dust, flakes, scales, nuggets occurring in alluvium.

Gossan Rusty weathered zone in rocks. Characterized by an abundance of alteration products of iron-bearing minerals (limonite, goethite).

Granite Grey to reddish coloured relatively coarse grained igneous rock composed mainly of feldspar with quartz.

Graphic granite A granite in which the quartz is arranged in the feldspar in geometrical patterns resembling hieroglyphic writing. An attractive ornamental stone.

Graphite C. H = 1-2. Dark grey to black metallic flaky or foliated masses. Flakes are flexible. Greasy to touch. Black streak and colour distinguish it from molybdenite. Usually occurs in metamorphic rocks. Used as lubricant, 'lead' pencils, refractories.

Greenockite CdS. H = 3-3½. Yellow earthy coating; rarely as pyramidal crystals. Resinous to adamantine lustre. Associated with sphalerite. Dissolves in HCl giving strong H_2S odour.

Greenstone A metamorphosed volcanic rock composed mainly of chlorite.

Gypsum $CaSO_4 \cdot 2H_2O$. H = 2. White, grey, light brown; granular massive. Also fibrous (satin spar); colourless, transparent tabular crystals (selenite). Distinguished from anhydrite by its softness. Occurs in sedimentary rocks. Alabaster (fine-grained translucent massive) and satin spar are used for carving into ornamental objects; the latter is chatoyant on the polished surface.

Halotrichite $FeAl_2(SO_4)_4 \cdot 22H_2O$. H = 1½. White hair-like crystals; spherical aggregates. Vitreous lustre. Astringent taste. Secondary mineral formed by weathering of pyrite.

Hellandite $(Ca, Y)_6(Al, Fe)\ Si_4B_4O_{20}(OH)_4$. H = 5½. Red to brown tabular, prismatic crystals. Occurs with tourmaline and rare earth minerals in granite pegmatite.

Hematite Fe_2O_3. H = 5½-6½. Reddish brown to black massive, botryoidal, earthy; also foliated or micaceous with high metallic lustre (specularite). Characteristic red streak. Ore of iron; also used as pigment.

Hisingerite Hydrated iron silicate. H = 3. Black to brownish black amorphous, compact, massive with conchoidal fracture. Greasy to dull lustre.

Hornblende $NaCa_2(Mg, Fe, Al)_5(Si, Al)_8O_{22}(OH)_2$. H = 6. Member of amphibole group. Dark green, brown or black. Vitreous lustre. Occurs as prismatic crystals and in massive form. Common rock-forming mineral.

Humite $(Mg,Fe)_7(SiO_4)_3(F,OH)_2$. H = 6-6½. Yellow to orange granular or massive. Vitreous to resinous lustre. Difficult to distinguish from other members of its group (chondrodite, clinohumite). Occurs in crystalline limestone.

Hydrocerussite $Pb_3(CO_3)_2(OH)_2$. H = 3½. Colourless to white or grey tiny hexagonal scales and plates. Transparent to translucent with adamantine or pearly lustre. Associated with cerussite from which it is not readily distinguished.

Hydromagnesite $Mg_5(CO_3)_4(OH)_2 \cdot 4H_2O$. H = 3½. Colourless to white transparent acicular or bladed crystal aggregates forming tufts, rosettes or encrustations; also massive. Vitreous, silky or pearly lustre. Occurs in serpentine, brucite, magnesite deposits. Effervescent in acids. Distinguished from calcite by crystal form.

Hydrotalcite $Mg_6Al_2(OH)_{16} \cdot CO_3 \cdot 4H_2O$. H = 2. White, transparent foliated lamellar aggregates; also platy. Pearly to waxy lustre. Greasy feel. Distinguished from talc by its effervescence in dilute HCl and by its superior hardness. Associated with talc, serpentine deposits.

Ilmenite $FeTiO_3$. H = 5-6. Black compact or granular massive; thick tabular crystals. Metallic to submetallic lustre. Black streak distinguishes it from hematite. Source of titanium.

Jarosite $KFe_3(SO_4)_2(OH)_6$. H = 2½-3½. Yellow to brown pulverulent coating associated with iron-bearing rocks and with coal. Distinguished from iron oxides by giving off SO_2 when heated.

Jasper Red, yellow, brown, green opaque variety of chalcedony. Used as a gem and ornamental stone.

Kaolinite $Al_2Si_2O_5(OH)_4$. H = 2. Chalk-white, or tinted with grey, yellow or brown, dull earthy masses. Clay mineral formed chiefly by decomposition of feldspars. Becomes plastic when wet. Used as filler in paper and in manufacture of ceramics.

Kornerupine $Mg_3Al_6(Si,Al,B)_5O_2(OH)$. H = 6½. Yellow to brownish and green elongated prisms, also fibrous and columnar. Vitreous lustre. Transparent. Occurs in metamorphic rocks. Transparent variety used as gemstone.

Kyanite Al_2SiO_5. H = 4-5, 6-7. Blue to green or greyish blue, long bladed crystals and bladed masses. Vitreous to pearly lustre. Hardness is 4 to 5 along length of crystal and 6 to 7 across it. Occurs in schist and gneiss. Colour and variable hardness are distinguishing features. Used in manufacture of mullite refractories.

Limestone Soft white or grey sedimentary rock formed by the deposition of calcium carbonate. Dolomite limestone contains variable proportions of dolomite and is distinguished from the normal limestone by its weaker (or lack of) effervescence in HCl acid. Crystalline limestone (marble) is a limestone that has been metamorphosed and is used as a building and ornamental stone. Shell limestone (coquina) is a porous rock composed mainly of shell fragments.

Limonite Field term referring to natural hydrous iron oxide whose true identity is unknown. Yellow-brown to dark brown earthy, porous ochreous masses; also stalactitic or botryoidal. Secondary product of iron minerals.

Lokkaite $(Y, Ca)_2(CO_3)_3 \cdot 2H_2O$. White radiating fibrous aggregates; massive. Alteration product of yttrium minerals.

Ludwigite Mg_2FeBO_5. H = 5. Greenish black to black opaque, longitudinally striated prisms; dull to sub-metallic lustre. Also fibrous, acicular or granular masses. Occurs with brucite, serpentine in contact metamorphic zones.

Malachite $Cu_2CO_3(OH)_2$. H = 3½-4. Bright green granular, botryoidal, earthy masses; usually forms coating with other secondary copper minerals on copper-beraing rocks. Distinguished from other green copper minerals by effervescence in HCl acid. Ore of copper.

Marble See limestone.

Marcasite FeS_2. H = 6-6½. Pale bronze to grey metallic radiating, stalactitic, globular or fibrous forms. Yellowish to dark brown tarnish. Transforms to pyrite from which it is difficult to distinguish in the hand specimen.

Martite Fe_2O_3. H = 5½-6½. Black octahedral crystals. Dull to splendent lustre. Pseudomorphous after magnetite.

Melanterite $FeSO_4 \cdot 7H_2O$. H = 2. Greenish white to green and blue massive, pulverulent; also stalactitic, concretionary, fibrous or capillary; short prismatic crystals (less common). Vitreous to dull lustre. Metallic, astringent taste. Soluble in water. Secondary mineral associated with pyrite and marcasite deposits.

Mesolite $Na_2Ca_2Al_6Si_9O_{30} \cdot 8H_2O$. H = 5. Colourless, white transparent acicular crystals or silky fibrous aggregates; compact. Associated with other zeolites in volcanic rocks.

Metasedimentary rock A metamorphosed sedimentary rock e.g. gneiss, schist.

Microcline $KAlSi_3O_8$. H = 6. White, pink to red, or green (amazonite) crystals or cleavable masses. Member of feldspar group. Distinguished from other feldspars by X-ray or optical methods.

Molybdenite MoS_2. H = 1½. Dark grey metallic (bluish tinged) tabular, foliated, scaly aggregates; also massive. Sectile with greasy feel. Distinguished from graphite by its bluish lead-grey colour and by its streak (greenish on porcelain, and bluish grey on paper). Ore of molybdenum.

Nepheline $NaAlSiO_4$. H = 6. White to grey irregular masses, less commonly as hexagonal prisms. Greasy to vitreous lustre. Distinguished from feldspar and scapolite by its greasy lustre and by its gelatinizing with HCl. Used in manufacture of glass and ceramics largely replacing feldspar for these purposes.

Olivine $(Mg, Fe)_2SiO_4$. H = 6½. Olive-green, vitreous, granular masses or rounded grains; also yellowish to brownish black. Distinguished from quartz by having a cleavage; from other silicates by its olive-green colour. Used in manufacture of refractory bricks; transparent variety (peridot) is used as a gemstone.

Orthoclase $KAlSi_3O_8$. H = 6. Red, pink or white feldspar. Short prismatic crystals. Vitreous lustre. Perfect cleavage. Distinguished from plagioclase feldspars by absence of twinning striations.

Paragneiss A gneiss derived from a sedimentary rock.

Peat Dark brown decomposition product of mosses and plants in marshy areas. Used as fertilizer, soil conditioner, insulating material, packing material, etc.

Pegmatite A very coarse grained dyke rock.

Periclase MgO. H = 5½. Colourless to grey and less commonly yellow, green or black octahedrons or grains. Transparent with vitreous lustre. Soluble in dilute HCl. Distinguished from spinel by its inferior hardness; spinel is not soluble in HCl.

Peristerite White albite having a blue schiller. Also called moonstone. Used as a gemstone.

Perovskite $CaTiO_3$. H = 5½. Reddish brown to black cubic or octahedral crystals; also granular massive. Adamantine to metallic lustre. Uneven fracture. Colourless to grey streak. Distinguished from titanite by its crystal form, from pyrochlore by its lustre and streak.

Phlogopite $KMg_3AlSi_3O_{10}(OH)_2$. H = 2½. Amber to light brown variety of mica. Used in electrical industry.

Plagioclase $(Ca, Na)(Al, Si)AlSi_2O_8$. H = 6. White or grey tabular crystals and cleavable masses having twinning striations on the cleavage surfaces. Vitreous to pearly lustre. Distinguished from other feldspars by its twinning striations.

Prehnite $Ca_2Al_2Si_3O_{10}(OH)_2$. H = 6½. Light green globular, stalactitic, masses with fibrous or columnar structure and crystalline surface. Vitreous lustre. Colour and habit are distinguishing features.

Pyrite FeS_2. H = 6-6½. Pale brass yellow (iridescent when tarnished) metallic crystals (cubes, pyritohedrons, octahedrons) or massive granular. Distinguished from other sulphides by colour, crystal form, and superior hardness. Source of sulphur.

Pyroaurite $Mg_6Fe_2(CO_3)(OH)_{16}\cdot 4H_2O$. H = 2½. Colourless, yellowish, blue, green, or white flaky, nodular or fibrous. Pearly or waxy lustre. Crushes to talc-like powder. Effervesces in HCl. Becomes golden yellow and magnetic when heated.

Pyroxene A mineral group consisting of Mg, Fe, Ca and Na silicates related structurally. Diopside, enstatite, aegirine, jadeite, etc., are members of the group. Common rock-forming mineral.

Pyroxenite An igneous rock composed mainly of pyroxene with little or no feldspar.

Pyrrhotite $Fe_{1-x}S$. H = 4. Brownish bronze massive granular. Black streak. Magnetic; this property distinguishes it from other bronze sulphides.

Quartzite A quartz-rich rock formed by the metamorphism of a sandstone. Used as a building and monumental stone, and if colour is pleasing, as an ornamental stone; high purity quartzite is used in the glass industry.

Rhyolite Fine-grained volcanic rock with composition similar to granite.

Rozenite $FeSO_4 \cdot 4H_2O$. Snow-white, greenish white, finely granular, botryoidal or globular encrustations. Metallic astringent taste. Difficult to distinguish in hand specimen from other iron sulphates with which it is associated.

Rutile TiO_2. H = 6-6½. Brownish red to black striated prismatic or acicular crystals; massive. Crystals are commonly twinned, forming elbow shapes. Adamantine lustre. Resembles cassiterite, but not as heavy and has light brown streak (cassiterite has white streak). Ore of titanium.

Scapolite $(Na, Ca)_4 (Al, Si)_4O_{8\ 3}(Cl, CO_3)$. H = 6. White to grey (less commonly pink, yellow, bluish, greenish) prismatic and pyramidal crystals; also massive, granular with splintery, woody appearance. Vitreous, pearly to resinous lustre. Distinguished from feldspar by its square prismatic form, prismatic cleavage, and splintery appearance on cleavage surfaces. May fluoresce under ultraviolet rays. Clear varieties used as gemstone.

Scheelite $CaWO_4$. H = 4½-5. White, yellow, brownish; transparent to translucent massive. High specific gravity (about 6). Usually fluoresces; this property is used as method of prospecting for this tungsten ore.

Schist Metamorphic rock composed mainly of flaky minerals such as mica and chlorite.

Serpentine $Mg_6(Si_4O_{10})(OH)_8$. H = 2-5. Usually massive with waxy lustre. Translucent to opaque in shades of yellow-green to deep green, also bluish, red, brown, black. Often mottled, banded, or veined. Asbestos is the fibrous variety. Formed by alteration of olivine, pyroxene, amphibole, or other magnesium silicates. Found in metamorphic and igneous rocks. Used as ornamental building stone (verde antique) and for cutting and/or carving into ornamental objects (ash trays, bookends, etc.).

Shale Fine-grained sedimentary rock composed for clay minerals.

Shear zone A region in which lateral movements along rock planes has produced crushed or brecciated rocks.

Sillimanite Al_2SiO_5. H = 7. White to colourless fibrous or prismatic masses. Vitreous or silky lustre. Distinguished from wollastonite and tremolite by its superior hardness. Occurs in schists and gneisses.

Skarn An altered rock zone in limestone and dolomite in which calcium silicates (garnet, pyroxene, epidote, etc.) have formed.

Slate Fine-grained metamorphic rock characterized by a susceptibility to split into thin sheets.

Smaltite $(Co, Ni)As_{3-x}$. H = 5½-6. Tin-white to silver-grey, finely granular, massive, colloform; or as cubic or octahedral crystals. Metallic lustre. Crystals can be distinguished from arsenopyrite by the crystal form; massive variety difficult to identify in hand specimen. Ore of cobalt.

Soapstone Metamorphic rock composed chiefly of talc; has massive fibrous texture and unctuous feel.

Sodalite $Na_8Al_6Si_6O_{24}Cl_2$. H = 6. Royal blue to purplish blue granular masses, also dodecahedral crystals. Vitreous lustre. Resembles lazurite but is harder, also distinguished from it by its association; sodalite in nepheline rocks, lazurite in crystalline limestone.

Specularite Black variety of hematite having high metallic lustre.

Sphalerite ZnS. H = 3½-4. Yellow, brown, or black, granular to cleavable massive; also botryoidal. Resinous to submetallic. Honey brown streak. Ore of zinc.

Spinel $MgAl_2O_4$. H = 7½-8. Dark green, brown, black, deep blue or green octahedral crystals, grains, or massive with conchoidal fracture. Vitreous lustre. Distinguished from magnetite and chromite by its superior hardness and lack of magnetic property.

Stalactite A conical or columnar accumulation of calcite or aragonite hanging from the roof of a cavern.

Stalagmite A columnar accumulation of calcite or aragonite on the floor of a cavern by dripping from the roof. A stalactite and a stalagmite may join to form a pillar of the cavern.

Strontianite $SrCO_3$. H = 3½. Colourless, white, grey, yellowish or greenish prismatic crystals, fibrous, columnar, massive granular. Vitreous lustre. Effervesces in dilute HCl. Distinguished from celestine by its effervescence in acid, from aragonite by its higher specific gravity. Ore of strontium.

Synchisite-Y $(Y,Ce)Ca(CO_3)_2f$. H = 6-7. Pink to reddish brown small prisms; massive granular. Associated with yttrium minerals. Also known as doverite.

Syenite An igneous rock composed mainly of feldspar with little or no quartz. Used as building stone.

Talc $Mg_3(Si_4O_{10})(OH)_2$. H = 1. Grey, white, various shades of green. Finegrained massive, foliated. Translucent with greasy feel. Masive varieties are known as steatite and soapstone, and because of their suitability for carving, are used for ornamental purposes. Formed by alteration of magnesium silicates (olivine, pyroxene, amphibole, etc.) in igneous and metamorphic rocks. Used in cosmetics.

Tengerite $CaY_3(CO_3)_4(OH)_3 \cdot 3H_2O$. Dull white powdery, fibrous coating, or encrustations; associated with yttrium minerals from which it alters.

Tetrahedrite (tetrahedrite-tennantite series) $Cu_{12}Sb_4S_{13}$ - $Cu_{12}As_4S_{13}$. H = 3½-4. (Tennantite harder). Flint grey to iron black, metallic, tetrahedral crystals; also massive granular to compact. Brown, black or deep red streak. Tennantite is less common than tetrahedrite. Ore of copper; contains values in silver, antimony.

Thomsonite $NaCa_2Al_5Si_5O_{20} \cdot 6H_2O$. H = 5-5½. Snow-white, pinkish white to reddish, pale green, radiating columnar or fibrous masses; also compact. Vitreous to pearly lustre. Transparent to translucent. Associated with other zeolites. Massive variety used as gemstone.

Thorite $ThSiO_4$. H = 5. Black to reddish brown tetragonal prisms with pyramidal terminations; also massive. Resinous to submetallic lustre. Conchoidal fracture. Radioactive. Distinguished by crystal form, radioactivity. Source of thorium.

Titanite (sphene) $CaTiSiO_5$. H = 6. Brown, wedge-shaped crystals; also massive granular. May form cruciform twins. Adamantine lustre. White streak. Distinguished from other dark silicates by crystal form, lustre and colour.

Tochilinite $6Fe_{0.9}S.5\,(Mg, Fe)(OH)_2$. Black fibrous, acicular, flaky or platy aggregates; bronze lustre. Occurs in serpentinite and in serpentine-bearing marble. Distinguished from graphite by its bronze lustre.

Tourmaline $Na(Mg,Fe)_3Al_6(BO_3)_3(Si_6O_{18})(OH)_4$. H = 7½. Black, deep green or blue, pink, brown, amber-coloured, prismatic crystals; also columnar, granular. Prism faces vertically striated. Vitreous lustre. Conchoidal fracture. Distinguished by triangular cross-section in prisms; by striations, fracture. Used in manufacture of pressure gauges; transparent varieties used as gemstone

Trap rock Dark coloured, fine-grained dyke rock.

Tremolite $Ca_2Mg_5Si_8O_{22}(OH)_2$. H = 5-6. White, grey, striated prismatic crystals, bladed crystal aggregates, fibrous, perfect cleavage. Usually occurs in metamorphic rocks. Fibrous variety is used for asbestos; clear crystals are sometimes cut and polished as a gem curiosity.

Uraconite Probably a U-sulphate. Yellow to green, earthy, nodular, scaly or botryoidal crust. Not a well-defined species.

Uraninite UO_2. H = 5-6. Black, brownish black, cubic or octahedral crystals; also massive, botryoidal. Submetallic, pitchy to dull lustre. Uneven to conchoidal fracture. Radioactive. Distinguished by high specific gravity (10.3 to 10.9), crystal form, radioactivity.

Uranophane $Ca(UO_2)_2Si_2O_7 \cdot 6H_2O$. H = 2-3. Yellow fibrous, radiating aggregates; massive. Occurs with uraninite.

Uranothorite Hydrous silicate of Th, U. H = 4½-5. Black prismatic crystals, grains. Pitchy lustre. May have orange-coloured sun-burst effect on enclosing rock. Radioactive. Occurs in granitic and pegmatitic rocks. Granular variety distinguished from thorite and uraninite by X-ray methods.

Vermiculite $(Mg, Fe, Al)_3(Al, Si)_4O_{10}(OH)_2 \cdot 4H_2O$. H = 1½. Silvery amber or light brown flaky, sheet-like aggregates. Pearly lustre. Expands or exfoliates on heating and this distinguishes it from mica. Formed by the alterations of phlogopite and biotite. Used as an insulator in construction industry, for concrete and plaster, as lubricant, etc.

Vesuvianite (Idocrase) $Ca_{10}Mg_2Al_4(SiO_4)_5(Si_2O_7)_2(OH)_4$. H = 7. Yellow to brown or green, apple green, lilac, transparent prismatic or pyramidal crystals with vitreous lustre; also massive, granular, compact or pulverulent. Distinguished from other silicates by its tetragonal crystal form; massive variety distinguished by its ready fusibility and intumescence in blowpipe flame. May be used as a gemstone.

Wakefieldite YVO_4. H = 5. Amber, yellow, tan, brownish, white, grey pulverulent in cavities in quartz; as coatings. Dull lustre. Occurs in pegmatite with rare-element minerals.

Wilsonite An altered scapolite. Pink, rose red, mauve to purple in colour. Clear variety used as gemstone. Was named for Dr. J. Wilson of Perth where it was originally found.

Xenotime YPO_4. H = 4-5. Prismatic crystals like zircon in shades of yellow, brown, grey. Vitreous to resinous. Distinguished from zircon by its inferior hardness.

Xonotlite $Ca_6Si_6O_{17}(OH)_2$. H = 6.5. Pink to white microscopic to fine compact fibrous masses. Vitreous to waxy lustre. Very tough. Weathered surface is chalk-white. Pink variety used as gemstone.

Zavaritskite BiOF. Yellow to grey granular to powdery with greasy to submetallic lustre. Associated with bismutite, bismuthinite, bismuth.

Zircon $ZrSiO_4$. H = 7½. Reddish to greyish brown tetragonal prisms terminated by pyramids; also colourless, green, grey. May form kneeshaped twins. Vitreous to adamantine lustre. May be radioactive. Distinguished by its crystal form, hardness and colour. Ore of zirconium and hafnium. Used in moulding sand, ceramics, and refractory industries; transparent varieties used as gemstones.

CHEMICAL SYMBOLS FOR CERTAIN ELEMENTS

Ag – silver
Al – aluminum
As – arsenic
Au – gold
B – boron
Ba – barium
Be – beryllium
Bi – bismuth
C – carbon
Ca – calcium
Cb – columbium (niobium)
Ce – cerium
Cl – chlorine
Co – cobalt
Cr – chromium
Cu – copper
Er – erbium
F – fluorine
Fe – iron
H – hydrogen
K – potassium
La – lanthanum
Mg – magnesium
Mn – manganese
Mo – molybdenum
Na – sodium
Nb – niobium
Ni – nickel
O – oxygen
P – phosphorus
Pb – lead
R – rare-earth elements
S – sulphur
Se – selenium
Si – silicon
Sn – tin
Sr – strontium
Ta – tantalum
Th – thorium
Ti – titanium
V – vanadium
W – tungsten
Y – yttrium
Yb – ytterbium
Zn – zinc
Zr – zirconium

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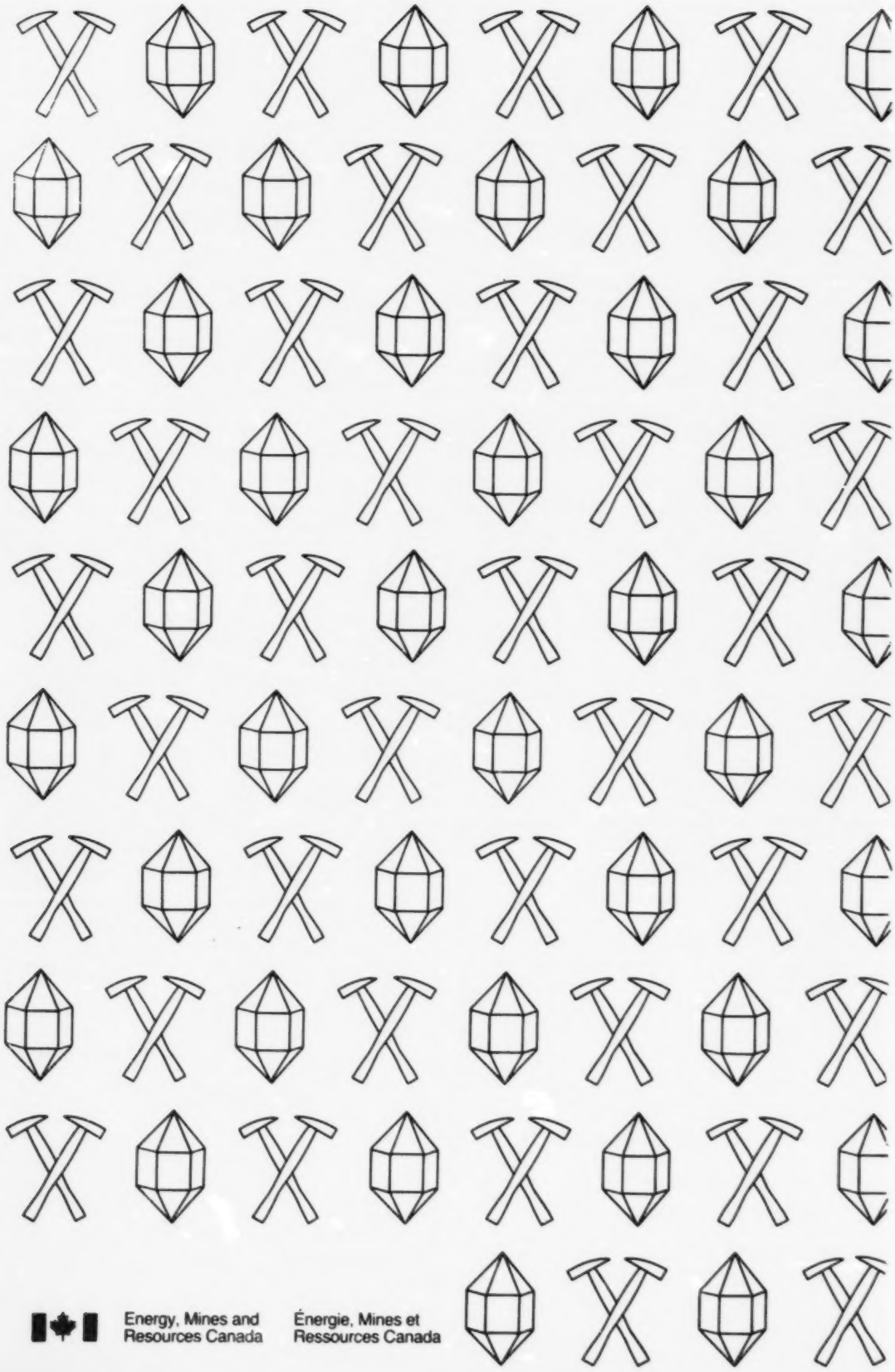

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